The Closed-End Investment Company Premium Puzzle
Model development and empirical tests on
Swedish and British data

Tomas Hjelström

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PREFACE

This report is a result of a research project carried out at the Center for Financial Analysis and Managerial Economics in Accounting at the Economic Research Institute at the Stockholm School of Economics.

This volume is submitted as a doctor's thesis at the Stockholm School of Economics. As usual at the Economic Research Institute, the author has been entirely free to conduct and present her research in her own ways as an expression of her own ideas.

The institute is grateful for the financial support provided by Bankforskningsinstitutet, Torsten and Ragnar Söderbergs Stiftelser and the Stockholm School of Economics.

Filip Wijkström
Director of the Economic Research Institute
at the Stockholm School of Economics

Kenth Skogsvik
Director of the Center for Financial
Analysis and Managerial Economics
in Accounting at Stockholm School
of Economics

This book is dedicated to my teacher and supporter Tore Tydesjö at the Njudungs gymnasieskola in Vetlanda, Sweden. Tore is the person who saw my early progress in the area of accounting. He is also one of those persons who has clearly shown his appreciation of my progress and who talked me into applying to the Stockholm School of Economics in the first place. Thank you!

Acknowledgements

A journey has come to an anticipated end. Finally. It took me much longer than I could have ever expected. I have seen the coastline for some time and I have been approaching the harbor for the last couple of months. Now, the mooring ropes are secured and the ship rocks gently by the quay. Many colleagues and friends who have seen the drifting ship have probably asked themselves: What harbor will be the final destination? Will the sails be ripped apart before that harbor is reached and what happens then? Now we all know. The ship made it. I must admit that I feel a strong sense of pride coming through me when I write these words. However, I also realize that it is necessary to be humble, when I look back at the accomplishment. Many persons and organization must be recognized for their contributions to the process.

Financially, the support from Bankforskningsinstitutet, Torsten och Ragnar Söderbergs Stiftelser and the Stockholm School of Economics have made it possible for me to complete this thesis during my time at the Stockholm School of Economics. The support from these organizations is gratefully acknowledged.

In terms of personal encouragement, helpful comments and general support, many names deserve to be mentioned. First, my head advisor, Professor Kenth Skogsvik, has read and commented on numerous drafts of the text as well as data print-outs from the many, many statistical analyses. Thank you for your insightful comments and your patience. I hope that you have not only been troubled by what you have seen. Now I am here with a much better product than without your help.

The composition of my advisory committee has changed a few times during the process. The only person, besides Kenth, who has been there during the entire journey, is Professor Nils Hakansson, University of California at Berkeley. We met during my stay at U C Berkeley and your relationship with Sweden when being here talking to me and your insights into financial theory have been very helpful. We have occasionally exchanged thoughts and comments subsequent to my stay in Berkeley during your visits to Sweden which has been helpful.

I would also like to thank Professor Timo Teräsvirta for his valuable comments on the statistics in the early phases of the project. At the end of the project Assistant Professor Richard Sandberg has been helpful in reading and commenting on the statistics in the final drafts of the thesis.

Professor Peter Jennergren joined the committee late in the process, but he has provided valuable comments on the theoretical modeling and the presentation thereof in the thesis. Thank you. I have also had the opportunity to benefit from your knowledge as a teaching colleague which has indirectly affected the thesis.

Professor Lars Östman is responsible for recruiting me in 1994. Lars was also a patient member of my committee for many years. Above all you have provided a different angle to the research problem. I still recall how you asked me again and again at the research proposal seminar about why this is an interesting issue and about the companies' role as active owners in this context. I had no good answer and that has bugged me, but it has made me thinking all these years. Thank you for our ongoing discussion of my project and for your general support. The fact that you seemed to take an interest has been reassuring.

Many other persons at the department of Accounting and Business Law have made my time here very pleasant. Early on Hans Hällefors, Mikael Runsten, Magnus Bild and Catharina Pramhäll contributed with interesting academic and non-academic discussions. You have all proved to be very good friends.

Hanna Setterberg, Håkan Thorsell, Katerina Hellström, Henrik Andersson, Stina Skogsvik and Jim Ohlson also deserve many thanks for their comments during our seminars. Hanna has been one of my most important friends and discussion partners for empirical matters during the past four years. Håkan has challenged me with statistical matters and "making-money-questions". Katerina and I have a mutual understanding of the fact of being a 1990er.

Johnny and I have had many early morning discussions about various issues. These discussions have helped many otherwise tough mornings. Walter, thank you for guidance on many issues, most importantly on pedagogical matters. Though, I still remember you reaction when I said that Jensen & Meckling is one of my key references. Niclas, Martin, Linda, Anna-Karin, Malin, Mats, Joakim, Gunnar, Elvi, Peter, Göran, Sigvard, Jan, Joakim, Vita and Bertil, thank you for your support and encouragement. However, Karin and Mari deserve a special mention. You have helped me so much during the years with all kinds of practical issues. You have also provided interesting discussions on politics, food and culture. We all need that.

One person still remains: Kalle Kraus. Despite our widely different research areas, you have fundamentally affected me and my work. The meeting with you, Martin, Hanna and I had when the 2x2 matrix was invented was great. We were a team, the four of us. You and I have discussed plenty of things and you have been valuable colleague and friend particular in the final phase.

Outside the Stockholm School of Economics, Abi is my "mate". He is always there when I need him and we can always talk and we do. Thank you so much.

Mom and Dad, you have believed in me and supported me in many ways. My father has read thousands of pages over the years and corrected many of them. You have been the solid lighthouse on a sometimes stormy sea. Thank you for being such good parents.

Louise, my sister, is full of love and questions. You are there and you always back me up and help in all possible ways of life.

My grandmothers have during my entire life provided me with the wisdom of life and general talks over a cup of coffee. Thank you!

My parents-in-law and Magnus and Eva also deserve many thanks. Most importantly for having turned me into a more hands person during these years and for the general support.

Last but most important is my closest family. I have had the benefit of having two children during these years, Sebastian and Alexandra. You have no idea about what I have done. But you have asked me thousands of times: When is the book finished? When are we going to have a party? I know now. The two of you have given me so much strength in this process. Anja, my partner in life. You have been the target of many more or less strange thoughts over the years and we have had very fruitful discussions. Thank you for being there, for loving me and letting me love you. I am not so sure that life will change dramatically now when the book is done, but both of us believe in "carpe diem" and we will.

Now I will sit down on the beach in Domsten for a while and simply enjoy the sea in its full beauty and power. I wonder what life has in store for me in the future. Whatever it is, a ship belongs at sea.

Skogås 2007-04-11

Tomas Hjelström

Contents

Part one The context and purpose of the study

The first part of the thesis contains two chapters. The intention of the two chapters is to establish a framework for the present study. This is done by discussing the general situation that a closed-end financial intermediary and more specifically a closed-end investment company operates in. This sets the context for the search for determinants for the pricing of these companies.

The previous research sets the context for this academic study. Alternative explanations are presented and collectively examined. The current study is put into this context and the contributions from the current study are discussed.

The combination of the two chapters leads to the purpose of this study which is

to theoretically and empirically investigate determinants for the premiums on closed-end investment companies in a European context

In addition to the above purpose, a partial direction of the study is framed as: The search for determinants is made with a special emphasis on the concepts of diversification, ownership structure and institutional setting.

1 Introduction

Is it possible to buy something for less than it is worth? Research on conglomerates and closed-end investment companies provides us with ample evidence of negative premiums relative to some kind of underlying value[1]. Berger and Ofek (1995) concluded that the average conglomerate premium on the US market during the 1980s was -13 to -15 percent and Klein (2001) reports a somewhat smaller premium of -7 to -8 percent during the 1960s[2]. Closed-end investment companies have in general shown negative premiums, though varying over time. The average premium on British investment trusts for the period 1973-2004 has been -13 percent and the corresponding number for Swedish closed-end investment companies is -22 percent. Figure 1.1 shows the evolution of average cross-sectional premiums on British investment trusts and Swedish closed-end investment companies during the past 32 years[3].

Apparently, it seems that investors can buy the net assets of closed-end investment companies for less than they are worth. The consistency of these findings over time combined with the no arbitrage condition (Ross, 1976) requires a search for explanations for the deviations rather than simply to draw the conclusion above. Such a search could be directed either towards explanatory components within the framework of a rational and homogeneous market or as a challenge to the foundations of our traditional asset pricing models.

[1] *Company* is here used to identify a closed-end financial intermediary and later more specifically a closed-end investment company. *Firm* is used to identify any other entity in which for example a closed-end investment company can invest.

[2] In this text, premium is used for both positive and negative deviations from a one-to-one relationship between the sum of the value of the underlying individual assets and liabilities and the traded price of the company which controls these assets and liabilities.

[3] Hereafter the expression "closed-end investment companies" is used for Swedish closed-end investment companies, British investment trusts and American closed-end funds unless otherwise stated.

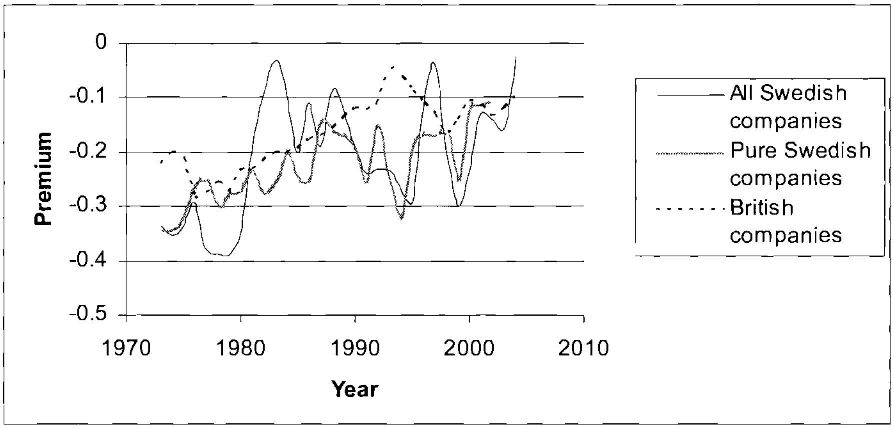

Figure 1.1: Observed premiums on Swedish and British investment companies/trusts from 1973 – 2004. See chapter 5 for a discussion of the characteristics of the companies.

The companies that have been investigated in studies on the premium phenomenon, all provide investors with some kind of investment expertise and/or diversification. Consequently, a general question regarding the premium phenomenon may be: What is the value and factors affecting the value of delegated portfolio management and diversification[4]? Another way of phrasing this is to ask oneself: What information does the price deviation convey about the business characteristics and the market's perceptions of these companies? Such questions put the emphasis on the structure and role of the companies that provide investment and/or diversification services in a broad sense. This triggers a large set of next level questions, for example:

- Does the relationship between the owners as a group and the company, i.e. the fixed number of shares outstanding, make a comparison between the current market value of assets and liabilities and the market value of the financial intermediary inappropriate?
- Does the pooling of funds from different individuals with different perspectives on investment opportunities (heterogeneous beliefs, investment horizon etc) matter with respect to portfolio choices?

[4] The expression delegated portfolio management refers to any kind of, professional or unprofessional, organized and discretionary help for an individual investor to allocate a part of his/her wealth for investment purposes.

- Does the ownership structure of the financial intermediary matter, since influence over investment decisions can differ due to the ownership structure?
- Are there institutional or structural differences that explain the international differences in levels and time-series variations as displayed in figure 1.1?

One characteristic of the companies concerned is central: the companies must be closed-end. The closed-end companies are traditional share issuing companies. The number of shares is fixed unless a decision is made at the general shareholders' meeting. This means that for an investor to sell shares, the investor must find a buyer who is willing to take on the risk and returns associated with the shares. This lack of flexibility opens up for the possibility for the share price to deviate from net asset value (nav) per share. An open-end company, on the other hand, has a flexible number of shares. When an investor sells shares, the shares are returned to the company at the current underlying value, the net asset value. This can be seen as a partial liquidation. Consequently, the price can never deviate from net asset value.

Other more general characteristics of the financial intermediaries of interest are:

- they invest in securities of other companies;
- provide their owners with risk diversification; and
- are public companies owned by a large set of investors.

These general characteristics of the financial intermediary could be taken as a fact from the perspective of the investor. However, investing through a financial intermediary is only one of the opportunities available for an investor. The available alternatives and the situation the investors face when investing in a closed-end financial intermediary are necessary to understand in order to discuss the premium phenomenon.

1.1 The investor's perspective

An investor, individual or institutional, has two main alternatives when the decision to enter the financial markets has been made. These are:

- to invest directly in securities based on the investors own decisions; or
- to invest indirectly by letting a financial intermediary do the selection for the investor.

The financial intermediaries may be either open-end or closed-end and they may have diversification and portfolio management as their core activity or as a balancing activity to their core business.

The pricing of open-end intermediaries has been discussed above and these intermediaries are beyond the scope of this project. The focus is entirely on the similarities and differences between a direct investment and an indirect investment through a closed-end financial intermediary. The comparison can be made from two perspectives,

- the cash flows and performance measures (section 1.1.1), and
- the delegation of portfolio choice (section 1.1.2).

1.1.1 Cash flows and performance measures

Regarding an indirect investment, the investor buys the security of the closed-end financial intermediary from another investor. During the holding period the investor receives dividends and/or interest depending on the kind of security. Thereafter, the investor sells the security again and receives the proceeds. Some transaction costs may be involved. The dividends/interest and gains/losses from the security of the closed-end financial intermediary is dependent on the cash flows as well as on the distribution policy of the closed-end financial intermediary. The closed-end financial intermediary makes investments in various investment objects with a corresponding cash transaction. During the holding period the company receives dividends and interest. Eventually the decision to sell a part of the portfolio is made and the company receives the proceeds from the disinvestments. These cash flows are identical to the ones obtained by the investor if the investor had made a direct investment.

Additionally, the financial intermediaries incur expenses due to management and board fees as well as external trading fees and potentially even taxes. These kinds of cash flows differ in magnitude and/or timing from a direct investment. The net cash inflows from the portfolio of securities to the investment company can in turn be handled in either of two ways; the company can distribute them to the investors or reinvest them in the portfolio of securities. Despite the general focus on cash flows, in terms of performance measurement, cash flows are not sufficient. Performance is seen as the increase in value during a limited period. Cash flows do not match value changes due to unrealized holding gains/losses. Unrealized value changes affect net asset value and as an effect comprehensive earnings, which can be seen as a performance measure[5]. The timing of the realization of value changes may have tax effects which could be favorable or unfavorable for the indirect investment in relation to the direct investment.

1.1.2 Portfolio choice and investor preferences

In the classic portfolio theory literature (Markowitz, 1952; Sharpe, 1964; Lintner, 1965), it is assumed that the investor does not have any private information or analytical ability above the market. Additionally, all investors have homogeneous beliefs about the future prospects of the companies and the market. The conclusion is that all investors should hold the market portfolio adjusted with lending/borrowing to match her risk preferences[6]. The individual investor obtains diversification by holding the market portfolio. This means that in-company diversification does not add value.

In this setting a closed-end financial intermediary is seen to consist of experts with potentially more information and/or greater analytical ability than the general market. If this is so, we would expect that a closed-end financial intermediary delivers returns which exceed pure index returns[7]. However, today many investors do not take prices as given. Investors have opinions about individual shares due to increased availability to the stock market and increased attention from media etc.

The delegation of control over the portfolio composition raises three important interrelated issues: elements of trust, preference alignment and

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[5] Comprehensive earnings are here seen as the earnings which make the clean-surplus relation hold.

[6] Additional assumptions included in these arguments are risk aversion on behalf of investors and that investors consider two parameters in choosing their portfolios, mean and variance of returns.

[7] According to the theory this should hold after a conventional risk adjustment is made.

heterogeneous beliefs. All of these questions are related to the principal-agent interaction. The organization of closed-end financial intermediaries is not identical in all societies, but the main structure tends to be the same with minor variations. The owners elect a board of directors at the general meeting. The board hires top management, which in turn hires the rest of the staff. This means that the owners/owner groups that controls the composition of the board potentially has extensive power over the portfolio composition. Such owners/owner group would fit the description of an active investor. The remaining investors can be classified as passive investors with no influence.

Another division of the owner population can be made with respect to the duration of the investment in the company, i.e. short-term or long-term. A long-term active investor aims at implementing long-term strategies, perhaps with long-term investments in other companies. A short-term active investor is more likely to restructure a company rapidly and in the case of the closed-end financial intermediary even liquidate it to benefit from a negative premium. If the short-term active investor succeeds, all owners will earn a good return, at least as long as liquidation costs are small. The short-term active investors can be seen as corporate raiders. They are not compatible with a going concern assumption in a rigorous sense.

In the case of the long-term active investor, the effect on the passive investors is not clear. This is where the issues of trust and preference alignment come into play. When the preferences of the long-term active investor are aligned with the passive investor there is no problem. The management will work for maximized profits given each level of risk for all investors. However, this might not be a likely scenario. Can all investors' preferences be perfectly aligned with respect to a large number of investments in a portfolio? Even if preferences were aligned, heterogeneous beliefs may cause a situation where the perceived value of a portfolio of securities differs among the investors. As an effect investors can not be expected to be willing to pay the full price for all investments in the portfolio of the closed-end financial intermediary. In that case diversification is actually a value destroying activity (Szombatfalvy, 1973; Miller, 1977).

When preferences are not aligned the dominant owner/group will prevail and the passive investor will end up with a portfolio which only to a certain extent matches her preferences. Such a case can have detrimental effects on the perceived value of the closed-end financial intermediary from a passive investors' perspective. If the dimension of trust in the ability and the incentives of the management are added to the analysis the previous negative effect can be exaggerated depending on trust or distrust (Jensen and Meckling, 1976). In the terminology of Hirschman (1970), since the passive investor has no possibility to use "voice" to change the current strategy the only option left is to exit. The problem with this exit given the closed-end structure of the financial intermediary is that someone else has to enter. If the active long-term investor is content with her current position, another passive investor has to enter and the same problems occur. Consequently, the price can be expected to fall to compensate for the lack of preference alignment, heterogeneous beliefs and/or trust/distrust.

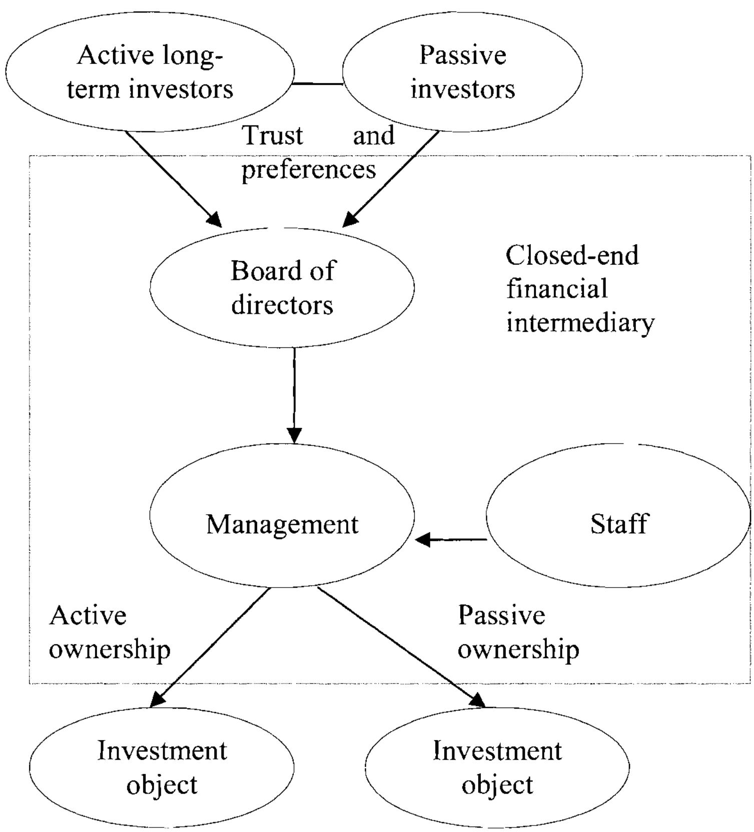

Figure 1.2: Ownership structure and control functions of a closed-end financial intermediary

According to this analysis, the core issue is concerned with the active owners' sensitivity to the preferences of the passive owners and willingness to adapt. The structure of the ownership and control functions in a closed-end financial intermediary is presented in figure 1.2.

1.1.3 Implications of the investor's perspective

From the discussion above, it seems that several issues have to be taken into consideration to grasp the full extent of the closed-end financial intermediary pricing problem. Moreover, their relationship is complex with potential interaction effects. Three major categories of interest are suggested

- *portfolio return and risk*,
- *heterogeneous beliefs,* and as a result of this the importance of portfolio composition and diversification,
- *ownership structure* due to the lack of preference alignment and trust/distrust.

In order to determine the scope and context of this research project, it is necessary to briefly outline the scope of and conclusions from previous research.

1.2 Previous research

Previous research on the closed-end financial intermediary premiums has mainly been done on closed-end investment companies and conglomerates on the US market. The remaining part has its origin in Great Britain focusing on investment trusts and a very small number of studies from other countries such as Sweden. Additionally, no cross-country comparisons have been identified in previous research. The only exception to this is when different country funds, all based in the US, have been compared normally with East Asian countries as their target market. This suggests that a potentially important source of exploration using slightly different cultural and institutional environments has been foregone so far. Moreover, data from small capital markets do not appear to have been explored.

The premium phenomenon on closed-end investment companies has been studied from many angles and many different explanations have been proposed. The major stream of research started in the late 1960s and early 1970s (e.g. Boudreaux, 1973; Malkiel, 1977). The early attempts to explain the phenomenon were focused on management fees and performance in a traditional setting. Tax effects and growth related variables such as distribution policy were also included. However, from these early days and onwards, the support for these explanatory variables has been weak. Gradually, variables with a focus on portfolio composition started to enter the models. The existence of restricted stock and the possibility for the closed-end investment companies to more easily get access to foreign capital markets were emphasized (e.g. Malkiel 1977; Bonser-Neal et al., 1990). By the late 1980s and early 1990s the attention turned more towards issues related to the area of behavioral finance and contracting theory.

Ownership structure in terms of the value effects of blockholders has been empirically investigated (e.g. Barclay et al., 1993; Malkiel 1995). The argument has been that if there are blockholders present, they have a unique opportunity to control the company and effectively seize certain benefits, most importantly pecuniary ones. The evidence has not only been weak but also conflicting. Additionally, the effects of a principal-agent relationship and the related effects on contracting to align incentives have been discussed. This has mainly been an extension of the traditional management fees argument. Various kinds of relationships between the management team, outside advisors and shareholders have been explored. As another refinement, the focus of the advisors in a particular company has been measured as the proportion of assets managed in that company relative to total asset managed by the advisors (e.g. Coles et al., 2000). Some empirical support has been found for these explanations.

Another area of research focuses on investor sentiment (e.g. Lee et al., 1991). It has been argued that many shareholders in closed-end investment companies are small and tend to invest in shares with a small market capitalization in combination with investments in closed-end investment companies. This would lead to a strong pricing/return relationship between the shares of closed-end investment companies and small-cap shares. Some but not very strong evidence has been found.

A summary of the investigated variables and their relationship to premiums is presented in table 1.1. The vast majority of the studies are empirical with few exceptions. The empirical studies have almost exclusively been conducted using regression analysis. Only, one or two variables have been investigated at the time, sometimes using a few of the original cash flow based explanatory variables as control variables. Finally, the time span of the data set has been short, normally including only a few years.

Explanatory variable	Association with premiums
Performance	Weak
Management fees	Very weak
Unrealized capital gains	Strong
Distribution policy	Weak
Turnover	Strong
Restricted stock	Strong
Foreign stock	Weak, conflicting
Blockholder ownership	Weak, conflicting
Investor sentiment	Weak
Incentive alignment variables	Semi strong

Table 1.1: Explanatory variables and strength of association between explanatory variables and premiums reported.

When it comes to research on conglomerates, the early studies were focused on documenting whether a negative premium existed and the magnitude of such premiums (Lang and Stulz, 1994; Berger and Ofek, 1995). The results were discussed earlier. The bulk of empirical studies trying to explain the negative premiums were presented in the late 1990s. Many studies have researched the effects of the internal capital created. The inefficient allocation of funds across divisions within the conglomerate is a common but somewhat disputable explanation (Shin and Stulz, 1998; Rajan et al., 2000; Whited, 2001). These studies in this area can be classified as dealing with the cash flow or numerator effect in a valuation problem. The cash flow based explanations can be attributed to closed-end financial intermediaries with a large investment in a small number of companies. Moreover, unquoted firms are probably more susceptible to cash flow effects than quoted firms are. The relevance of the explanation for well-diversified closed-end financial intermediaries is limited.

Agency cost related to corporate diversification as an explanation for negative premiums on conglomerates has also been studied (Denis et al., 1997). The agency issue potentially has a cash flow effect but it could also be viewed as a risk measure in line with the discussion of trust in 1.1.2. Lamont and Polk (2001) show that diversified firms both exhibit cash flow effects and market return effects, which is to be viewed as both a cash flow generating effect and a risk effect. All studies have been performed on the American market.

A thorough review of previous research on closed-end investment companies and conglomerates can be found in chapter two.

1.3 Purpose and contributions

The presentation above of the general framework for analyzing closed-end financial intermediaries has described a fairly wide and complex issue. The complexity is based on three categories of explanations and their interaction; portfolio return and risk, portfolio composition and diversification, and ownership structure. Previous research has examined each of the categories to various degrees. Each category has been examined a number of times in separate studies. However, the search for explanations for premiums ought to be a combination of traditional cash flow/earnings related variables and measures of portfolio diversification and ownership structure. Such a holistic approach to understanding premiums can elaborate on these complex interactions between the proposed categories. The number of studies devoted to each of the three categories in previous research reveals a lack of attention towards issues of diversification. Specifically, the relationship between management, influential and non-influential shareholders in terms of diversification and agency aspects deserves more attention.

Previous research also reveals a lack of research focusing on other capital markets than the US market. If different capital markets are seen as independent draws from a large population, any market is sufficient to make statements about the worldwide population. However, differences in the institutional setting and investment approaches contribute to a heterogeneous population. This heterogeneity drives a need for studies of financial intermediaries on other capital markets than the US. Moreover, the single market approach of previous research has, as argued before, excluded the possibility of direct comparisons between findings from different capital markets. A study with data from more than one country opens an opportunity for studying the effects of explanatory variables. If the additional dimension of time is entered, a long time frame also allows for interesting changes in the business climate and institutional settings to occur.

Theoretical modeling with an origin in traditional valuation techniques has been the starting point for the analysis. Thereafter, operationalization of the identified concepts, both related to cash flows and risk measures can widen the set of determinants for the premiums studied. This includes feasible ways to measure concepts such as trust and diversification identified above. This has to be done within the limits of the intentions of the theoretical modeling and moreover as directly derived as possible from complementary theories.

The discussion so far has been general and concerned with financial intermediaries providing portfolio management and investment expertise. The expected complex relationships between the different proposed determinants call for a sufficiently uncomplicated kind of companies to study. Despite the lack of industry complexity, the sample must provide sufficient variation both cross-sectionally and over time for relevant company characteristics. The closed-end investment companies provide such a sample. In line with the discussion above, an international sample of closed-end investment companies is desirable. American closed-end investment companies are excluded for two reasons. First, they have been extensively researched previously. However, evidence from published American research can serve as a framework for evaluating research based on data from other countries. Second, the cost and time involved in researching American data is beyond the scope of this study.

British investment trusts are quoted on the biggest capital market in the European Union. They control large amounts of capital and they have a long history on the capital markets[8]. The population of trusts is large and their characteristics are similar though not identical to their US counterparts. As a basis for an international European based study, such a sample is a natural benchmark.

In contrast to this large capital market approach, the Swedish capital market and the closed-end investment companies provide a different setting. The five to seven largest closed-end investment companies have a very influential position on the Swedish capital market. Their influence covers both the amount of capital they control and the influence they can exercise as owners of other firms. Moreover, varying groups of these companies have had a substantial amount of long-term investments, both quoted and unquoted. These characteristics enrich the study by making it possible to

[8] The first investment trusts were founded in the 19th century.

investigate the financial effects of companies on the organizational borders towards venture capital companies and conglomerates.

The concept of diversification can be thoroughly examined using the wide range of investment strategies. From an ownership perspective, the Swedish companies exhibit a much more concentrated ownership structure. Some of the largest companies are directly controlled by a well-defined and close group of individuals. Swedish closed-end companies are still allowed to use separate voting power for different classes of shares, which further accentuates the possibilities for investigating the value of the concepts of control and trust. The institutional setting both in terms of restriction on the behavior of the companies from a tax perspective and the evolution of the capital market is very different from the British case. The author's nationality and economic education in Sweden provides in-depth knowledge and familiarity about the market conditions. Moreover the number of closed-end investment companies on the Swedish stock exchange is limited. This ensures that detailed analyses of the companies can be made without substantial delays. The combination of these two features provides a unique opportunity for an in-depth study.

The time period studied should be long enough to ensure a sample that is large even on a small capital market as the Swedish one. The focus on the evolution over time and therefore ability to study the stability over time of empirical findings also demands a long time period. The chosen time period stretches from 1973 to 2004. This leads to the purpose of the present research project, which is

> **to theoretically and empirically investigate determinants for the premiums on closed-end investment companies in a European context.**

The purpose of the project should be seen in a wider context where the applications of the findings are expected to be applicable to other financial intermediaries than closed-end investment companies. The closed-end investment companies are seen as a sample from a wider population based on financial intermediaries. The search for determinants is made with a special emphasis on the concepts of diversification, ownership structure and institutional setting. Particularly the concepts of diversification and ownership structure are assumed to have a wider applicability. Finally, the study is aimed at providing a European perspective on the premium phenomenon in contrast to the previous American dominance.

The current project contributes to our understanding of the determinants of the premium on closed-end investment companies in four areas. First, a deeper analysis of the impact of portfolio performance is done. Previous research has focused on the return on net asset value. The current project refines this approach to focus on the returns on quoted (unrestricted) and unquoted (restricted) shares in the portfolio respectively. This is done for the Swedish sample.

Second, the lack of evidence regarding a relationship between administrative expenses and premiums is noticeable. The current project contributes to this literature by refining previous measures of administrative expenses and their relationship to premiums. Particularly, the target is to differentiate between the relationship between premiums and two parts of administrative expenses. The two parts can be classified as agency costs and other administrative expenses respectively.

Third, the role of diversification is examined. The project contributes to our understanding of the role of financial intermediaries providing diversification. The value effects of diversification provide evidence on whether investors prefer a concentrated portfolio or broad diversification. The project also provides contributions on the role of diversification given certain institutional settings, such as less accessible capital markets.

Fourth, the project contributes to our understanding of the impact of ownership structure on premiums. The project has an emphasis on different kinds of measures of ownership concentration. Moreover, the interaction between diversification and ownership concentration is studied to investigate the exercised control by majority shareholders. Exercised control is argued to be a core explanation for agency costs.

The contributions to the various areas of knowledge are materialized in certain key findings. The findings from this project suggest that

- Past performance is weakly related to premiums (sections 6.4.1, 6.4.2 and 7.1.2);
- Future expected performance for unquoted securities is weakly related to premiums (sections 6.4.1, 6.4.2 and 7.1.1);

- Administrative expenses classified as agency costs are significantly negatively related to premiums. Other administrative expenses are significantly positively related to premiums (section 8.1.3);
- Diversification is negatively related to premiums. The impact is particularly strong in the range of low to medium levels of diversification (sections 8.1.1.2 and 8.1.2);
- Formal and controlling power is negatively related to premiums[9]. This negative relationship is strengthened when shares with different voting power are used (sections 8.1.1.2 and 8.1.2); and
- Low asset risk limits negative premiums due to diminished agency problems (section 8.2).

The findings briefly presented above provide additional insights into the differences between American and European closed-end investment companies. American closed-end investment companies are mostly either equity investors or bond investors. No pure bond investing companies exist in Great Britain or in Sweden. However, British companies partially invest in bonds and the present sample has shown that premiums are reflected by these partial investments in low risk assets.

Sharp differences in the premiums of British and Swedish closed-end investment companies have been identified. The explanation for these differences appears to be strongly associated with ownership structure and diversification. Institutional limitations on the behavior of British companies exclude a more focused investment strategy. Consequently, British companies can not limit their negative premium by investing in a concentrated portfolio of securities. Swedish companies that have employed such a strategy have increased their premiums.

The more negative premiums on Swedish companies can to a large extent be explained by the concentrated ownership structure and the differential voting power for different classes of shares. The negative impact on premiums is substantial. There are legal limitations in Great Britain that prevent this situation. The difference in premiums due to diversification and ownership structure is further shown when the pure Swedish investment companies are examined. These companies show greater similarities with the British

[9] Controlling power exists when the largest owner has high formal power and the closed-end investment company has a concentrated portfolio with large investments in few companies.

companies than other Swedish companies do. The premium patterns are also strongly related with the British companies.

It should be noted that Swedish closed-end investment companies to a large extent take an active part in the management of the portfolio companies, which is not generally the case for British companies. In this sense they can affect the future prospects of these companies and thereby prices and returns. The findings presented here do not suggest that the stock market allows this to generally affect premiums. Expected future returns on unquoted securities potentially reflect effects of the active ownership by increasing value. Effectively, the present findings suggest that tightly controlled closed-end investment companies that act as active owners through concentrated portfolio experience more negative premiums.

1.4 Outline of the report

The rest of the thesis is structured as follows. A comprehensive review of previous research is presented in chapter two. Chapters one and two provide the initial framework of the study. Chapter three, four and five constitute part two of the book. The analytical framework and institutional setting is presented. Chapter three describes the theoretical base model. Chapter four discusses the operationalization of the theoretical model, necessary amendments and statistical hypotheses. Chapter five presents the institutional settings during the time period and in the two countries, with special focus on the evolution of the capital markets and the tax systems. Chapters six, seven, eight and nine provide the empirical results, analyses and conclusions from the study. Chapters six and seven present the empirical results from the tests of the model including an evaluation of the results in relation to model and previous research. Chapter eight includes a discussion of the result based on non-performance based measures, i.e. the implications of portfolio diversification, portfolio composition and ownership structure on premiums levels. In chapter nine, the findings are summarized and the implications of the study are discussed.

2 Previous research

In this chapter the current body of research on premiums on closed-end investment companies and related areas are described. In chapter one, three areas for the determinants were identified. First, there is the fundamental issue of performance. Second, there is the issue of the value of diversification due to heterogeneous beliefs held by the investors of the closed-end investment company. Third, there is the value impact of the ownership structure, which generates agency costs. Apart from an initial brief chronological description of the evolution of research, the presentation of previous research follows these three areas. Some issues investigated in previous research could be characterized within two or more of the identified areas. The different aspects are then discussed under the relevant heading of each issue. Such dual interpretations concern mostly the administrative expenses as a measure of agency costs in the ownership structure area.

Two major surveys of previous research on the premiums of closed-end investment companies have been identified. The first one has an American origin and it provides a summary of the findings from the 1970s and the 1980s (Anderson and Born, 1992). The second one is British and was issued in 2002 (Dimson and Minio-Paluello, 2002). The main part of the findings provided in that publication is from the period 1990 – 2001. Both of these surveys have provided substantial contributions to the current overview.

2.1 A chronological summary

The academic research on the premium on closed-end investment companies grows in the early 1970s. The puzzling observation of the pricing of the closed-end investment companies had prompted discussions by practitioners earlier than that. Most of the early research is conducted on the American market. This research relies on the advances in portfolio theory developed during the early 1960s. Accordingly, the focus is on the trade-off between risk and return in the traditional setting. The focus on closed-end investment companies can also be seen as an extension of the risk and return studies on open-end investment companies during the mid-1960s.

The main papers from this period are Boudreaux (1973), Malkiel (1977) and Thompson (1978). The findings are disappointing. The hypothesized relationships between various return measures and premiums are given little empirical support.

During the 1980s and most of the 1990s, two new areas emerge and dominate the research on closed-end investment companies: the agency cost and the investor sentiment explanations. The agency cost explanations stems from the seminal work of Jensen and Meckling (1976). Most of the research within this area focuses on the role of administrative expenses in explaining premiums (e.g. Malkiel, 1977; Baur et al, 1996). During this period attempts to link non-cash flow measures to premiums are scarce. Some work on the relationship between blockholder ownership and premiums can be found (e.g. Barclay et al., 1993).

The investor sentiment explanations stems from the behavioral finance area, which emerged around 1980. The core idea behind this research is that there are at least two groups of investors on the market and that they have private beliefs about the future prospect for a firm. The two investor groups generally differ with respect to the supply of information and/or rationality. Evidence shows relationships that confirm suggestions of a segmented market (e.g. Lee et al., 1991; Pontiff, 1995). The uninformed/irrational group seems to dominate the closed-end investment company market. Moreover, the additional risk created due to the behavior of uninformed/irrational investors appears to be non-diversifiable.

The degree of diversification as a measure of investor heterogeneity can be seen as a special case of the investor sentiment explanations. The degree of diversification as an explanation for premiums rests on assumptions that investors have private beliefs about value of the individual securities in the portfolio. No test of the degree of diversification in closed-end investment companies is identified. During the 1990s research is conducted on the issue of conglomerate diversification, which can be seen as a related area (e.g. Berger and Ofek, 1995).

The latter part of the 1990s and the beginning of the 2000s contain a diverse stream of research. The traditional return and risk explanations are revisited and combined with the agency cost and the investor sentiment explanations. The traditional explanations are reactivated by Deaves and Krinsky (1994) and Malkiel (1995). Later papers on the determination of risk adjusted returns using factors models are important steps in the development of the traditional explanations (e.g. Chay and Trzcinka 1999; Dimson and Minio-Kozerski, 2002).

The research on administrative expenses and agency cost is also refined. The compensation schemes of the advisors are analyzed (e.g. Coles et al. 2000). The impact of board structure and independence of directors in the closed-end investment companies are studied (e.g. Del Guercio et al. 2003). The Swedish market, where a system of dual class shares exist, is studied from a power perspective (e.g. Holmén and Högfeldt 2005).

Substantial contributions to our understanding of premiums on closed-end investment companies have been made during the past 40 years. The methods and theoretical explanations are refined during the period, which has led to new insights. Empirical findings have provided support for several of the new areas of explanations, but a coherent picture of the phenomenon is hard to obtain. Consequently, premiums on closed-end investment companies remain one of the most intriguing puzzles in finance.

After this chronological overview, the chapter continues with detailed accounts of the development of each explanation. This is done based on the three main areas: performance, investor heterogeneity and ownership structure.

2.2 Performance

Research investigating the area of performance constitutes the core of the research on premiums on closed-end investment companies. Performance measures are used in two ways: to determine the value/premium on the shares and to evaluate the management team. Previous research efforts regarding performance have studied both of these aspects. Performance generically captures a wide range of components to measure managerial accomplishments. The current focus is on profitability, measured as the return on net asset value, and the components thereof. Three main areas of performance exist for closed-end investment companies:

- the return on the portfolio of assets or net assets (before or after incurred expenses) generally corrected for some measure of risk (section 2.2.1);
- administrative expenses (section 2.2.2); and

- taxes (section 2.2.3).

The empirical examination of the areas of performance involves choices regarding how to operationalize the concept. In terms of performance these choices concern three broad issues:

- the measurement of returns and risk adjustments;
- the representation of the market's or the individuals' beliefs about future performance (which is assumed to be the value relevant measure of performance); and
- the time series behavior of the chosen measure of performance.

Administrative expenses are as a proportion of assets or some flow measure quite stable over time. Presumably, investors' beliefs about future levels of administrative expenses are relatively unproblematic. Moreover, the time series behavior is given. Taxes are given by exogenous institutional factors, the tax laws, and the returns. In most cases the institutional factors are such that taxes play no direct role for valuation[10]. Consequently, in general the issues of representation of beliefs and the time series behavior of the performance measure are mostly relevant for the return on the portfolio of assets/net assets.

The empirical studies discussed in this section are summarized in table 2.1. Section 2.2.1 contains a presentation of the research on the performance on net asset value or similar asset bases. Sections 2.2.2 and 2.2.3 contain presentations of the research on administrative expenses and taxes respectively.

[10] The tax systems in Sweden and the UK are discussed in chapter 5, section 5.2.

Authors	Published	Sample origin	Sample size[i]	Sample period	Examined explanations[ii]
Boudreaux	1973	US	13 equity	1960 – 1970	Risk adjusted NAV returns (0) Turnover (sign dependent on premium)
Roenfeldt & Tuttle	1973	US	12 equity	1953 – 1970	Risk adjusted NAV returns (+)
Sharpe & Sosin	1975	US	10 equity	1933 - 1973	Risk in net asset value vs investment company shares (higher in shares)
Malkiel	1977	US	24 equity	1967 – 1974	Risk adjusted NAV returns (0) Administrative expenses (0) Unrealized gains (-)
Leonard & Noble	1981	US	19 equity	1968 – 1977	Non-stationary risk, unreasonable to extrapolate past performance
Lee, Shleifer & Thaler	1990	US	n/a	n/a	Risk adjusted NAV returns (-)
Brickley, Manaster & Schallheim	1991	US	14 equity	1969 – 1978	Loss of tax timing options (-)
Kumar & Norohna	1992	US	max 47 equity p.a.	1976 – 1986	Administrative expenses (-)
Kim	1994	US	Evaluation against previous empirical findings		Loss of tax timing options (-)
Norohna & Rubin	1995	US	Only bonds	1980 – 1990	Administrative expenses (-)

Table 2.1: Summary of empirical studies on performance and its components in chronological order

[i] Equity means companies mainly investing in shares and bond means companies mainly investing in bonds. The sample size refers to the number of companies in the cross-section, not the number of firm-year observations.
[ii] Sign indicates sign of a statistically significant relationship with premiums or the theoretical prediction. 0 means no statistical significance.

Deaves & Krinsky	1994	US	Theoretical		Administrative expenses, probability of liquidation affects sign
Malkiel	1995	US	30 equity	1994	Risk adjusted NAV returns (0) Administrative expenses (0) Unrealized gains (-)
Bal & Leger	1996	UK	92 equity	1975 – 1993	Persistence of residual returns, weak persistence identified,
Baur, Coelho & Santoni	1996	US	23 equity	1970 – 1990	Administrative expenses (-)
Pontiff	1997	US	52 equity	1965 – 1985	Risk in net asset value vs CEIC shares (higher in CEIC shares)
Chay & Trzcinka	1999	US	94 equity 22 bond	1965 – 1993 1973 – 1990	Risk adjusted NAV returns short term (+), long term (0)
Coles, Suay & Woodbury	2000	US	81 equity and bond	1978 – 1991	Administrative expenses (0)
Bers & Madura	2000	US	67 equity 317 bond	1976 – 1996	Persistence in performance, particularly strong for CEICs investing in stocks
Ross	2002	US	1 equity	-	Administrative expenses (-)
Bleaney & Smith	2003	UK/US	23 UK equity 28 US equity 31US bond	1980 – 2001 Less for US data	Persistence in return (0) Risk adjusted NAV returns short term (-), long term (+)

Table 2.1 cont.: Summary of empirical studies on performance and its components in chronological order

2.2.1 Return on assets/net assets

In summary, despite numerous investigations, the evidence regarding the relationship between premiums and risk adjusted return on assets/net assets remains weak. The early findings show no relationship at all. During the past 10 years, some evidence has been published suggesting a positive relationship. This seems to be a result of more sophisticated measures used for the risk adjustment. Additionally, it can be noted that no study has been found that attempts to investigate the impact from parts of the portfolio of a company. Such parts could be bonds and shares within a company or quoted and unquoted shares. This section distinguishes between three aspects of return on assets/net assets:

- the initial and CAPM based measures of risk, return and expectations formation (section 2.2.1.1);
- more elaborate representations of risk, return and expectations formation (section 2.2.1.2); and
- the persistence in risk adjusted returns (section 2.2.1.3).

2.2.1.1 The CAPM based risk adjusted returns

Empirical research on premiums on closed-end investment companies starts with a study by Boudreaux (1973). He recognizes that the textbooks on investments at the time ignore the closed-end investment companies despite their unique characteristics. He discusses particularly the characteristic that both the assets and the claims on the company are publicly traded securities. Moreover, he emphasizes the core insight that it is the active portfolio management that is necessary to drive fluctuations in premiums. He writes:

> *"....the only time one should expect that the market price per share of a closed-end fund be equal to (or bear a constant discount relationship to) its net asset value per share would be if the market felt that the fund would never alter its present portfolio of securities."* (Boudreaux, 1973, p. 517)

Furthermore, Boudreaux recognizes that the return on the net assets is the basis for value. The argument about active portfolio management makes him focus on turnover as the core driver for returns. The problem with turnover is that it can only drive the magnitude of premiums not the sign of the premium. This is so since turnover may generate both positive and negative risk adjusted returns. Consequently, turnover can not be used in ordinary regressions with the premium as the dependent variable. However, the absolute value of premiums can be used as the dependent variable. Alternatively, the absolute value of residuals from a regression where premiums are regressed on other proposed explanatory variables can be used. Boudreaux uses both alternatives. He also runs regressions on either positive or negative premiums separately[11].

He also uses three measures for returns: growth in net asset value, return to variability and return to volatility. Return to variability is measured as

$$\text{Return to variability} = \frac{\text{Growth in nav - Risk free rate}}{\text{Growth in nav}}$$

and return to volatility is measured as

$$\text{Return to volatility} = \frac{\text{Growth in nav - Risk free rate}}{\beta_{\text{nav}}}$$

The return to volatility measure corrects for the systematic risk in the net asset value.

Boudreaux finds strong support for the turnover variable. The strongest support is found for positive premiums. The return to volatility measure is significantly related to premiums, but the other return measures show no relation. The return to variability and volatility measures partially absorb the same information as the turnover variable, leaving the turnover variable insignificant[12]. This is expected since turnover is supposed to result in returns which affect premiums.

[11] Boudreaux controls for two more variables: a dummy for the stock exchange at which the company is traded at (NYSE or AMEX), the number of shares traded.

[12] This is based on the residual from the initial regression of return to volatility, volume traded of the investment company shares and where the share of the investment company is traded.

In a contemporary study, Roenfeldt and Tuttle (1973) use the Jensen's alpha[13] as the performance measure on their sample. They find that closed-end investment companies that traded continuously at a discount during the period also had a negative risk-adjusted contemporaneous performance. One closed-end investment company in their sample traded at a continuous though small positive premium. During this time this company exhibited a large positive performance measure. The small sample they use casts doubts on the possibility to generalize the results, and the sample size contributes to the lack of significance for most results. No detailed information is provided for the premium levels, which makes it difficult to evaluate the proposed relationship between premiums and performance.

In 1977, Malkiel presents the most comprehensive study on closed-end investment companies for many years to come. He uses two different measures of performance: raw net asset value return and Jensen's alpha measure. The raw returns were measured for the past one, two and ten years respectively. The sample is larger than those previously used (see table 2.1). Despite the larger sample and the variety of performance measures, Malkiel finds no empirical support for performance as a determinant for premiums. In 1995, Malkiel replicates his study. The lack of support for performance remains.

Lee et al. (1990) was one of the first studies to examine the relationship between current premiums and future performance. They find a weakly significant relationship. The most striking result in this study is that the estimated coefficient has the opposite sign of what was hypothesized. They find a negative relationship between premiums and future performance. No explanation based on investor rationality was presented for this finding.

2.2.1.2 New elaborate measures of risk adjusted returns

Various measures of performance as the determinant for premiums are generally based on traditional portfolio theory from the 1960s. The measures used in these studies rely on an adjustment for systematic risk generally based on the capital asset pricing model. One example of this is the study by Sharpe and Sosin (1975). They use calculations of beta for the underlying

[13] Jensen's alpha is the intercept from the regression of the specific asset return less the risk free interest rate on the return on the market portfolio less the risk free interest rate.

net asset value and the premiums separately in order to determine if any additional systematic risk is incurred through the premium[14]. Moreover, stationary levels of risk are generally used for calculating over- or underperformance. In the 1980s and most importantly in the 1990s, the measure of risk is the critical element in the performance studies. Some minor improvements can be identified as can be seen below.

Leonard and Noble (1981) is an early example of a study with elaborate measures of risk adjusted returns. They investigate the performance and risk behavior over time without making the assumption of a stationary risk level. The concept of a managed portfolio of securities implies that the manager can affect both the return and the risk level. There is no reason to assume that risk should be stationary over time. They use a switching regression under the assumption of two different regimes. The regimes are characterized by a low and a high risk portfolio for each company respectively. They conclude that both performance and risk are characterized by substantial non-stationarity.

Non-stationary risk generates a need for period specific risk adjustment. From this perspective a general evaluation of performance based on an index is not sufficient. Firm and time specific systematic risk has to be controlled for. Regarding performance, the non-stationary characteristic suggests that extrapolation of past performance is unreasonable. However, it is still possible that some companies over long periods of time may over- or underperform. The findings presented by Leonard and Noble only suggest that consistent performance between short periods is not to be expected.

In contrast, Chay and Trzcinka (1999) find a positive relationship between performance and premiums. The observed relationship is strong for closed-end investment companies investing in stocks, but not for companies only investing in bonds. They use an extensive sample to investigate the relationship between the one-, two- and three-year ahead performance and current premiums. Moreover, they apply five different risk adjustments[15]. Such an extensive approach to measuring risk is not identified elsewhere. Measures of performance are used both before and after administrative expenses have been deducted.

[14] Sharpe & Sosin find no evidence of additional systematic risk incurred by the investors through the premium.
[15] These adjustments are a CAPM based adjustment, a five-factor arbitrage pricing model, Carhart's four factor model, a conditional CAPM and no adjustment.

The positive findings relate to the one-year-ahead performance. The longer time horizons show no significant relationship. Their findings are robust for different risk adjustment techniques. One of the adjustments is no risk adjustment. Interestingly, the lack of adjustment performs equally well as the more refined approaches. Their results show that the performance measures where administrative expenses are excluded are somewhat more strongly related to premiums than measures after administrative expenses. Considering the large sample, the extensive tests and the strongly significant results, the findings have significant impact on the expectations for the present study.

The risk faced by the investors of the closed-end investment company is the risk of the shares in the company. A risk adjusted measure of return on assets should then capture this risk and not only the risk involved in the portfolio of securities. Pontiff (1997) investigates the relationship between the risk of the shares of the company and the underlying portfolio. He uses monthly returns on both net asset value and the shares of the company. He concludes that the volatility of the shares is as much as 64 % higher than the volatility of the underlying portfolio[16]. A problem with a measure of volatility is that it does not distinguish between diversifiable and non-diversifiable risk. In fact, Pontiff also tries to distinguish between the two types of risk by using the market risk, the small firm risk, the book-to-market risk and discount movements for other funds. He concludes that 15 % of the excess volatility can be explained by these risk factors, i.e. non-diversifiable risk. As a result, the non-diversifiable risk is approximately 10 % higher for the shares than for the underlying net asset value[17].

The findings by Pontiff suggest that risk adjustments based on the share price risk of the closed-end investment company is more appropriate in order to capture all investor risk. Controlling for the additional systematic risk ought to be a logical complement to the net asset value based risk adjustments.

[16] Volatility is measured as the variance of the total return.
[17] This is obtained by multiplying 64 % with 15 %, which yields 9.6 %.

2.2.1.3 The persistence in risk adjusted returns

Persistent risk adjusted returns should have higher impact on premiums than transitory components. Consequently, the persistence in risk adjusted returns has strong impact on expected coefficients and the number of time periods included in the regression models. The research on the persistence in performance is mostly performed on open-end investment companies. The case of closed-end investment companies presents two different perspectives on persistence. First, there is the persistence in the performance of the underlying assets/net assets, which is identical to the open-end companies. Second, there is the persistence in the performance of the shares of the closed-end investment companies. The focus on the determinants of premiums leads to an emphasis here on the first kind of persistence, i.e. performance of the underlying assets/net assets.

Bal and Leger (1996) is one of the earliest examining the persistence in performance for closed-end investment companies. Moreover, it is one of the few studies using British data. Their study is a combination of investigations of the performance of British closed-end investment companies and the persistence in the performance. They use conventional Sharpe, Treynor and Jensen measures to evaluate the companies. They find some persistence in performance based on the Sharpe ratio. The results suggest that the persistence is mostly driven by income funds[18]. A stronger stability in dividend flows than in price performance from the portfolio companies could explain the observed higher persistence.

Bers and Madura (2000) is one of the earliest studies on performance persistence using American data. They investigate both closed-end investment companies investing in shares and bonds respectively. The difference in the results between the two kinds of companies is strong. Bond funds show statistically significant performance persistence. From an economic perspective, however, the evidence is weak. The stock funds show very strong results, both with respect to explanatory power and coefficient levels. The reported persistence prevails for as long as 36 months. The degree of persistence diminishes substantially but it remains highly significant. The findings are surprising, since Chay and Trzcinka (1999)

[18] Income funds are closed-end investment companies that are mainly focused on obtaining dividends and channel them through to the shareholders of the closed-end investment company.

report only an effect on premiums for one-year-ahead performance. Correctly inferred persistence would result in relationships between three-year-ahead performance and current premiums in a bivariate analysis. The initial interpretation is that the market does not forecast the persistence appropriately. However, the development of the coefficients for the one-, two- and three-year ahead are similar for the two studies. This suggests that the underlying pattern of the relationship between premiums and performance still may be the same. If so, the market may react appropriately.

Bleaney & Smith (2003) combine the two components, persistence in performance and the relationship between performance and premiums, for determining the premiums. This is fundamentally the same approach as Bal and Leger (1996) apply. In addition to the Bal and Leger study, Bleaney and Smith use both British and American data. They find that net asset value returns for closed-end investment companies investing in shares show no persistence except for one month ahead. Companies investing in bonds show a somewhat higher persistence for periods over one year, but it is weak. Interestingly, they find a significant relationship between past returns and premiums. The relationship tends to shift signs depending on the time horizon. Short term past returns are negatively related to premiums and returns for the past year or more are positively related to premiums. The positive relationship for longer time periods is driven by cross-sectional characteristics. In the time series dimension the relationship is negative and weaker. The general findings are the same for both samples, but they are stronger for the British sample. These results suggest that investors use past performance to differentiate between companies and that this behavior has effects on premiums. The negative and smaller effects over time are consistent with the lack of return persistence. It should be noted that both the cross-section and the time series effect are small for economic purposes. The findings are inconsistent with the findings by Bers and Madura.

2.2.2 Administrative expenses

Most prior research uses measures of total (risk adjusted) return on assets/net assets as the independent variable. Interestingly, despite administrative expenses being one of the original explanations (e.g. Pratt, 1966; Szombatfalvy, 1973), only a few tests have been performed where administrative expenses are used separately. Moreover, some of the tests have been performed isolated from other performance measures. Seven studies have been identified that specifically investigate the relationship between administrative expenses and premiums empirically (Malkiel, 1977; Kumar and Norohna, 1992; Deaves and Krinsky, 1994; Norohna and Rubin, 1995; Malkiel, 1995; Baur et al., 1996; Coles et al., 2000).

Malkiel (1977) focuses on administrative expenses in general. This variable is operationalized as expenses excluding brokerage and interest expenses. Coles et al. (2000) use two variables: advisor compensation (i.e. management fees) and other expenses[19]. Kumar and Norohna (1992) appear to use a total expense ratio. This approach must include all expenses, also those that have not been included in the other studies. Moreover, expenses such as taxes are probably included too though it is not explicitly stated. Deaves and Krinsky (1994), Norohna and Rubin (1995) and Baur et al. (1996) use the same measure as Kumar and Norohna.

Malkiel (1977) uses the administrative expense ratio as one of the explanatory variables. He finds no support for a relationship with premiums. It appears that he uses a performance measure which potentially is after administrative expenses[20]. If this is so, administrative expenses are potentially included twice in the model. This would cause multicollinearity and it may explain the weak results. Malkiel (1995) performs a new study with essentially the same variables. The results regarding administrative expenses remain unchanged.

Coles et al. (2000) are generally concerned with the agency aspects of the management team. They investigate the impact of different compensation schemes on premiums. Moreover, they investigate the relative amount of funds managed in a particular company to the entire amount of funds managed by the management team[21]. One of the control variables included in the statistical model is the management expense ratio and the other-expense ratio (see above). The management expense ratio shows a negative relationship with premiums while the other expense variable has a positive relationship. Neither of the two expense ratios shows any significant result. Coles et al. also include the marginal management expense ratio in the

[19] This measure includes all other expenses incurred by the closed-end investment during the year.

[20] Malkiel states that total return on net asset value is used in his regressions to obtain the alpha parameter as a measure of performance on net asset value.

[21] It is common in the US and the UK that a management team manages more than one closed-end investment company.

model[22]. The authors state that the two management expense ratios are significantly positively correlated. Consequently, the exact impact of the traditional expense ratio is difficult to determine due to multicollinearity. The conclusion that can be drawn from the study is that expenses probably have a negative impact on premiums. The form of that impact is still difficult to determine.

The insignificant results from Malkiel (1977) spurred Kumar and Norohna (1992) to use a different measure of administrative expenses. Kumar and Norohna derived an expression for administrative expenses denominated by a cash flows measure rather than the previously used net asset value. The cash flow measure used is administrative expenses plus distributed dividends as the denominator[23]. This measure can be interpreted as how much of the cash outflows that goes to management and shareholders respectively. The reasonable and suggested assumption is that the more cash that goes to the management relative to the shareholders the lower the value of the company and thereby a lower premium. They find statistically strong results in favor of the proposed negative relationship between administrative expenses and premiums. Norohna and Rubin (1995) find a similar negative relationship using the same specification as Kumar and Norohna.

A specification identical to the one derived by Kumar and Norohna is also used by Ross (2002). He argues that the traditional explanations to premiums, i.e. performance and administrative expenses, are still valid despite the limited empirical support. Using a numerical example based on an empirical case, Ross shows that the observed negative premiums can be explained by a perpetual stream of expenses. Ross is silent on two potentially important parts of the premiums. These are potential over- and underperformance and the relationship between dividends, expenses, performance and growth. Ross assumes that no over- or underperformance is present and that everything a very high degree of earnings is paid out as dividends. The implicit and restrictive assumptions may be valid in the US[24]

[22] The marginal expense rate is multiplied with the proportion of assets under management by the team in the particular investment company. Consequently, the interaction is not necessarily strong between this multiplicative variable and the management expenses ratio.

[23] Under the assumption that expenses are the only driver for excess returns, this specification is identical to the infinite discounting using the Gordon growth model.

[24] American closed-end investment companies are required to distribute all capital gains and 85 % of dividend income.

where the dividend requirements are very restrictive. The general case is less obvious.

Deaves and Krinsky (1994) start with the same model as Kumar and Norohna. They then introduce the possibility that investment companies performing badly and/or having high expenses may be converted into open-end investment companies. They argue that as long as the company, net of all expenses, performs in line with the required rate of return, the probability of open-ending is negligible. The probability of open-ending is thus hypothesized to be negatively related to performance. Their modeling results in a situation where administrative expenses are positively related to premiums when expenses are high and negatively related when expenses are low. This is so since at some level of administrative expenses, the probability of open-ending becomes sufficiently large to drive the premium towards zero. Effectively, premiums should be negatively correlated with administrative expenses for small to medium levels. For high levels of administrative expenses the premiums should be positively correlated with premiums.

Deaves and Krinsky do not perform any empirical tests based on their predictions. Theoretically, their results could explain the lack of significance for a linear representation of the administrative expense ratio. Estimated signs of the coefficients are then an effect of the relative proportion of the companies in the sample on each side of the cut-off point.

Baur, Coelho and Santoni (1996) provide additional evidence of a negative relationship between administrative expenses and premiums[25]. Empirically, they use a measure of administrative expenses that is identical to the one employed by Kumar and Noronha. Baur et al. obtain strong result in favour of a negative relationship between administrative expenses and premiums. It should be noted that the time period studied in these two studies are overlapping. Kumar and Noronha use a cross-sectionally wider sample compared to Baur et al. but Baur et al. use a longer time period.

[25] Baur et al. refer to management expenses but it is measured as total expenses.

2.2.3 Taxes

Taxes are hypothesized to have an impact on premiums for two different reasons: unrealized capital gains in the portfolio of securities held by the closed-end investment company and the value of tax timing options. Each of the reasons is presented below as is the limited empirical evidence.

The capital gains tax reason is based on a situation where either the closed-end investment company or the individual investor pays capital gains taxes. The taxes are generated by the capital gains on the securities held by the closed-end investment company. If taxes are paid, then unrealized capital gains will generate future cash outflows. The present value of these future cash outflows should motivate a negative premium.

The impact of taxes on premiums is directly related to the structure of the tax system in the specific country. Effectively, this is outside the control of the closed-end investment company. The arguments concerning unrealized capital gains are based on the American tax system. The degree to which the results are possible to generalize is country dependent.

The American tax laws require that 90 percent of the capital gains are distributed as dividends for exemption from corporation tax. The capital gains dividends are then taxed on the individual level. The British tax system is fundamentally different. Capital gains must not be distributed as dividends. The retained capital gains are not taxed within the company. The individual investors are taxed on the realized capital gains on the shares in the investment company[26]. The Swedish companies may distribute capital gains at their own will. Individual investors are only taxed on the realized capital gains on the shares of the investment company[27,28].

[26] British individual investors pay dividend taxes dependent on the degree of corporation tax paid by the investment company.
[27] Swedish individual investors pay dividend taxes on distributed dividends independent on the tax payments by the investment company.
[28] A comprehensive discussion about the British and Swedish tax systems is provided in chapter 5.

The empirical evidence from tests of the unrealized capital gains is limited. In fact only Malkiel (1977) and Malkiel (1995) directly test the hypothesis[29]. In both studies, he finds a negative relationship between premiums and unrealized capital gains. Malkiel (1977) also tests for the impact of the capital gains dividends on premiums[30]. The relationship is strongly positive. Both of these findings are consistent with the predictions.

As argued by Malkiel, portfolio turnover is a measure that is strongly related to the unrealized capital gains (the higher the turnover, the lower the unrealized capital gains). Turnover is used as explanatory variable by Boudreaux (1973), Malkiel (1977) and Malkiel (1995). Boudreaux and Malkiel (1995) find an expected positive relationship with premiums. The findings are based on US data and it must be emphasized that these findings are not easy to generalize to other tax jurisdictions.

The second reason relating taxes to premiums concerns tax timing options. All taxable securities provide the investor with the opportunity to decide when to realize capital gains/losses. Under an assumption of rationality, an investor is expected to use this option to minimize the present value of tax payments. It is well known that the value of the portfolio of options on some assets is higher than the value of an option on the portfolio of the underlying assets. In combination this has implications for the valuation of closed-end investment companies. The value of the tax timing options on the underlying portfolio is foregone when shares in the closed-end investment company is acquired. The value of the tax timing option on the shares of the closed-end investment company is positive but less than the foregone value, i.e. a negative premium should arise.

Brickley et al. (1991) and Kim (1994) have developed models for the relationship between measures related to the tax timing options and premiums. Both studies show evidence in favor of the existence of a value loss due to tax timing options. Brickley et al. show that higher volatility in

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[29] Baur et al. (1996) claims that they test the unrealized capital gains tax effect. Their operationalization is very different from a derived measure and the implication of their findings is unclear. They use the percentage of equities in the portfolio of securities as the measure that should capture the unrealized capital gains tax effect.
[30] Large capital gains dividends imply high realized capital gains. It is important to emphasize that this measure also partly captures overall performance.

the underlying portfolio drives lower premiums[31]. The premiums also seem to be positively related to market and portfolio raw performance[32]. Given that the volatility is higher in bad markets, this is in line with theory.

Kim's (1994) model focuses on the volatility of the portfolio of securities and the correlations between the shares in the portfolio. The higher the correlations between the shares the less can be gained from holding the underlying portfolio in terms of tax timing options. Kim discusses his results in the context of previous empirical findings. He shows that the empirical findings are consistent with his model.

The evidence provided with respect to taxes shows that taxes have an effect on premiums. The evidence provided has focused on certain areas of the tax aspects. The first argument regarding unrealized capital gains is mostly a tax matter internal to the company. Notably, the investigations have been done using a balance sheet item as the explanation for the premium. Taxes are eventually cash flows which should be related to tax expenses. Despite this observation the income statement approach of linking tax expenses to premiums has never been employed.

The second argument regarding the tax timing options is related to tax planning on the individual level. This is beyond the impact of the closed-end investment company. The issue is more related to the existence of the closed-end investment companies as a group.

Despite their very different characteristics, both of these aspects ought to have consequences for the pricing of the shares in the closed-end investment companies. The empirical studies give some support for the theoretical predictions. As argued above, the implication for a study on British and Swedish data is unclear. Both of these tax systems differentiate strongly between the investor in the closed-end investment company and the company itself. The closed-end investment company is seen as an individual tax subject, which is given tax relief. It is not only an intermediary that provides a service and makes the economic benefits flow through the company. The timing of the tax effects is then different. This matter is further discussed in chapters 3 through 5.

[31] Brickely et al. (1991) uses discount as their term for the value discrepancies. In their terminology, it says that the deeper the discount is the higher the volatility is.
[32] The explanatory power of these findings is low.

2.3 Investor heterogeneity – beliefs, behavior and diversification

The research presented above is based on traditional finance theory. The findings are neither fully consistent between studies nor conclusive with respect to determinants for the premiums. Moreover, researchers conclude that not even in the case of an (expected) conversion to an open-end investment does the pricing mechanism seem to behave entirely as predicted by traditional theory. For example, Brickely & Schallheim (1985) show that abnormal earnings can be earned after the announcement of an open-ending. Furthermore, Brauer (1988) shows that there is a relationship between the probability of open-ending and premiums but that the mapping is incomplete. As a result a substantial proportion of the research on closed-end investment companies has turned towards other explanations. Research on the relationship between investor beliefs and their behavior is discussed in section 2.3.1. Research on the relationship between investor beliefs and diversification is discussed in section 2.3.2. Key data about the articles discussed in this section are described in table 2.2.

2.3.1 Investor beliefs and behavior

The most influential of the new directions of research is concerned with investor behavior. The most fundamental assumption underlying the hypotheses proposed in this area is that it is necessary to recognize the existence of different investor groups. The investor community is populated by groups of investors with different beliefs. Alternatively there exists a group of investors with irrational behavior. The existence of multiple investor groups with different beliefs/behavior are combined with limited arbitrage opportunities. These assumptions are violations of the key assumptions in traditional finance. The focus of the behavioral finance research has been to establish connections between the pricing of groups of shares with similar exposure to a certain investor group. An example of this is closed-end investment companies and small firms, where some empirical support has been found.

Zweig (1973) develops a model based on investors' expectations to explain stock price movements (the investors' expectations theory). He focuses on two investor groups, one informed and one uninformed. The uninformed group of investors pushes price off its intrinsic value level. Eventually the informed investors act on the market and correct prices. Zweig uses closed-end investment company premiums as a proxy for the uninformed investors' expectations[33]. The findings are supportive of the investors' expectations theory. The supportive findings suggest that the premiums may be driven by factors outside the traditional explanations.

DeLong et al. (1990) build on the findings of Zweig's. They develop a model based on two groups of investors: sophisticated investors and noise traders, specifically including noise trader risk. Noise trader risk captures the notion that the behavior of the noise trader is unpredictable. The additional risk incurred due to noise traders is assumed to be sufficiently widespread to be non-diversifiable[34]. If the sophisticated investors would try to arbitrage the premiums, they would stand the risk that noise traders will worsen the premium situation for the arbitrageurs. DeLong et al. assume that noise traders and noise trader risk is present in the closed-end investment companies. This is what drives premiums. The direction of the impact on premiums depends on noise traders' misperception and the magnitude of the noise trader risk.

The paper by DeLong et al. constitutes a starting point for a series of papers investigating effects of the behavior of different investor groups on premiums. Individual investors are presumed to be less informed and they react more erratically to new information than institutional investor. Their behavior is hypothesized to result in two observable phenomena. First, do companies from different industries but with a high proportion of individual investors tend to follow the same valuation and return patterns? Second, do individual investors react differently to information than institutional investors? Lee et al. (1991) examine the assumption of different investor groups and how their behavior affects prices in an investment company context. They conclude that American closed-end investment company premiums are strongly cross-sectionally correlated. They argue that one of the major reasons for the strong correlation is that these companies are to such a large extent owned by individual investors. Based on these findings

[33] Investors in the closed-end investment company are assumed to have worse information about the companies in the portfolio than the investors in the securities included in the portfolio.

[34] The non-diversifiable character of the noise traders' behavior affects the arbitrage opportunities. Sophisticated investors with a limited investment horizon can not take unlimited bets against the noise traders.

Lee et al. argue that if individual investor sentiment causes premiums then other firms with similar ownership structures should experience simultaneous value shifts. Firms with small capitalizations tend to have a similar ownership structure. They conclude that the relationship between premiums and returns are stronger for the small size portfolios than for the larger ones[35]. In a sensitivity test they show that the results change over time. No differences in the relationship between premiums and the size portfolio are found for more recent observations. Lee et al. argue that this is due to a change in the ownership structure for the small size companies.

The findings by Lee et al. have given rise to a vivid debate with Chen et al. (1993) and following papers. Chen et al. represents the traditional approach to the premium phenomenon. The debate is concerned with two issues. The first issue concerns the stability of the results presented by Lee et al. Chen et al. argue that the findings in Lee et al. (1991) arise as a result of the sample structure and how the tests are performed. Second, the suggestion that the lack of evidence for the latter period is due to a shift in the ownership structure of small firms is questioned. Chen et al. provide regressions where the focus directly is on the level of institutional ownership on the same sample with much less clear results[36]. Chopra et al. (1993) reply that the results are real and that the specifications provided by Chen et al. are not better than the specifications from the Lee et al. (1991)[37]. The debate ends with a short comment by Chen et al. (1993). The discussion suggests that the results of Lee et al. (1991) are questionable but not entirely refutable. Moreover, the new stream of research based on the behavioral aspects of finance is under strong criticism from the traditional proponents such as Chen et al.

Swaminathan (1996) builds on the evidence provided by Lee et al. (1990). He uses the same data to further examine the time series properties of the relationship between premiums on closed-end investment companies and the return on small firms. He finds a similar contemporaneous positive relationship between premiums and the return on small firms. However, he

[35] Lee et al. examine the relationship by regressing the return on different size based portfolios on the change in the value weighted discount for all closed-end investment companies.

[36] The small firm decile is divided into groups with high and low institutional ownership respectively.

[37] Navin Chopra is now added to the set of authors defending the original article by Lee et al. (1991).

finds that premiums are negatively correlated with future returns on small firms. This is consistent with a short term mispricing of the closed-end investment companies and small firms. These findings support the propositions made by Lee et al. (1991). However, Swaminathan also finds some evidence that premiums predict future earnings growth (positively) and inflation (negatively). These predictions are stronger for small firms than for large firms, but still significant for large firms. These results are not expected if the correlation between premiums and the return on small firms were only due to investor sentiment.

Sias (1997) shows that individual investors are more sensitive to changes in market conditions than institutional investors are. Sias uses closed-end investment companies to examine this sensitivity. He argues that closed-end investment companies are held by individual investors to a relatively high degree, while the underlying portfolio of securities tends to be relatively more held by institutional investors. Net asset value should then be less responsive to changes in market conditions than the price of the closed-end investment company shares. The evidence provided by Sias can be seen as an explanation of Swaminathan's (1996) findings on the relationships between premiums and future earnings growth and inflation. Furthermore, the increased sensitivity for individual investors can also be interpreted as overreaction. If so, the evidence from both Swaminathan and Sias is compatible with the original findings of Lee et al. (1991).

Gemmill and Thomas (2002) perform a test of the predictions by De Long et al. (1990) and the findings by Lee et al. (1991) on British data. They find evidence in line with the predictions that investor sentiment drives premiums[38]. British premiums show a strong relationship with the flows in and out of open-end investment companies. The deviation from some underlying fundamental value is dependent on the possibility to replicate the underlying portfolio. The more difficult it is to replicate the underlying portfolio, the larger the deviation from the underlying fundamental value. Finally, Gemmill and Thomas can not find any evidence of systematic noise trading risk in line with the suggestions by De Long et al.

[38] Investor sentiment is used to describe an attitude towards certain securities that is originally prompted by psychological not necessarily rational causes.

Authors	Published	Sample origin	Sample size	Sample period	Examined explanations[i]
Szombatfalvy	1971		Argumentative		Diversification results in negative premiums due to heterogeneous beliefs
Zweig	1973	US	24 undefined companies	1965 – 1970	Existence of different investor groups, informed investor corrects mispricing
Miller	1977		Theoretical		Diversification results in negative premiums due to heterogeneous beliefs and a positive value bias in the portfolio companies
Bhide	1990		Argumentative		Improved external capital markets make internal capital market less important. Conglomerate premiums become more negative.
DeLong, Shleifer, Summers & Waldmann	1990		Theoretical		Noise trader risk, informed investors are exposed to risk, limits arbitrage opportunities
Bonser-Neal, Brauer, Neal & Wheatley	1990	US	49 equity	1981 – 1989	Premium effects of changed investment barriers to foreign countries. Removed barriers (-), increased barriers (+)

Table 2.2: Summary of articles on investor heterogeneity - beliefs, behavior and diversification in chronological order

[i] Sign indicates sign of a statistically significant relationship with premiums or the theoretical prediction. 0 means no statistical significance.

Lee, Shleifer & Thaler	1991	US	68 equity	1956 – 1987	Cross-sectional correlation between CEIC premiums, caused by investor sentiment
Chen, Kan & Miller	1993	See Lee, Shleifer and Thaler (1991)			Methodological arguments regarding Lee et al. 1991
Chopra, Lee, Shleifer & Thaler	1993	See Lee, Shleifer and Thaler (1991)			Methodological arguments regarding Lee et al. 1991
Chen, Kan & Miller	1993	See Lee, Shleifer and Thaler (1991)			Methodological arguments regarding Lee et al. 1991
Berger & Ofek	1995	US	3 659 firms	1986 – 1991	Conglomerates have negative premiums. Cross industry diversification have more negative premiums.
Swaminathan	1996	US	68 equity	1965 – 1985	Correlation with small firm indices (+), Correlation with future small firm returns (-)
Servaes	1996	US	<= 518 firms per year	1961 – 1976	Conglomerate negative premiums in the 1960s, less negative in recent periods.
Bekaert & Urias	1996	US/UK	43 US 37 UK equity	1986 – 1993	Diversification benefits differ between UK and US CEICs, which can explain premiums.
Denis, Denis & Sarin	1997	US	993 firms	1984 – 1989	Diversification can be seen as an agency cost. Empirical evidence support the hypotheses.

Table 2.2 cont.: Summary of articles on investor heterogeneity - beliefs, behavior and diversification in chronological order

Sias	1997	US			Individual investors are more sensitive to changes in market conditions than institutional investors are. Premiums are affected by such changes.
Grullon & Wang	2001	US	34 equity	1982 – 1998	Quality of information held by informed and uninformed investors drive premiums. Uninformed investors require the risk premium. Empirical support for hypothesis.
Klein	2001	US	36 firms	1966 – 1974	Acquisitive conglomerates show more negative premiums for recent periods.
Lamont & Polk	2001	US	2 390 firms	1979 – 1997	Higher risk for diversified companies than non-diversified companies.
Gemmill & Thomas	2002	UK	158 equity	1991 – 1997	Correlation with in- and outflows from open-end companies (+)
Laeven & Levine	2005	Inter-national	<= 836 firms/year	1998 – 2002	Negative diversification premiums for financial firms.

Table 2.2 cont.: Summary of articles on investor heterogeneity - beliefs, behavior and diversification in chronological order

The discussion related to investor sentiment so far has been based on assumptions of irrational behavior by individual investors creating noise. Grullon and Wang (2001) formalize a reason for this irrationality by discussing it in terms of informed and uninformed investors. They derive a theoretical model based on different quality in information signals to the investors in the underlying portfolio of securities and the investors in the closed-end investment company. In this model two components are necessary to create a negative premium: a sufficiently high degree of informed investors in the underlying portfolio of securities; and the quality of the private information held by the informed investor in the underlying portfolio must be sufficiently high. Then uninformed investors require an additional risk premium. Arbitrageurs are seen as uninformed institutional investors, who only act on the level of the premium. They increase institutional ownership in the closed-end investment company, but they do not contribute to the relative level of informed ownership. Note that in this model, the uninformed individual investors demand a higher risk premium. This is contradictory to the model by DeLong et al. where the informed investors demand the risk premium.

In test on US data, Grullon & Wang find strong empirical support for their hypothesis regarding differences in the level of informed ownership. Moreover, they find strong evidence for a negative relationship between premiums and the excess volatility of the closed-end investment company shares compared to the underlying portfolio. In order for this additional volatility to be priced on an efficient market it should be non-diversifiable as discussed by Zweig (1973). The authors do not address this issue.

In summary, research focusing on investor beliefs and behavior has established some empirical evidence with respect to how premiums are determined. The studies are based on the notion of heterogeneous investor groups. The heterogeneity is generally based on the assumption that different investor groups draw different conclusions from existing information or that information differs between investor groups. The empirical examination indirectly supports the existence of heterogeneous investor groups. The heterogeneous investor groups may in turn cause different effects on premiums. The premiums may correlate with for example the return on small firms due to exposure to the same investor groups. Alternatively, excess volatility may exist due to noise traders.

However, the existence of different investor groups is not sufficient. Arbitrageurs ought to correct any mispricing due to irrational behavior. The findings presented above suggest that some kind of market imperfection is present. The nature and limit of any imperfection is not determined[39]. Meanwhile, the implications for determinants for the premiums remain to be explained. The evidence only shows the characteristics of premiums over time. The question about what is empirically the cause of the investors' behavior remains unanswered.

2.3.2 Investor beliefs and diversification

Another application of research based on different investor groups is more strongly focused on the heterogeneous beliefs. This stream of research can be seen a reaction to traditional finance based on assumptions of homogeneous beliefs. Heterogeneous beliefs are proposed to have a negative impact on the value of diversification. Most of the debate in this area has been either argumentative or mathematically theoretical in nature.

The traditional finance literature such as Sharpe (1964) and Lintner (1965) and others had drawn important and strong conclusions about asset prices and investor diversification in the 1960s. The findings have been the basis for theoretical and empirical studies for decades. However, these findings were based on a representative investor or homogeneous beliefs among the investors. In the mid- and late 1970s, a number of articles were published that challenged the assumption of homogeneous beliefs (e.g. Miller, 1977 and Harrison et al., 1978) or displayed the restrictive conditions for conclusions regarding the market to hold (e.g. Brennan et al., 1978). The effects on the prices and markets are less predictable under these circumstances.

Szombatfalvy (1971) argues that one of the reasons for negative premiums may be that investors have opinions about the value of the securities in the portfolio. These opinions may differ substantially from the observable market valuation. This is fundamentally an argument about investor heterogeneity and the effects of this on the pricing of the portfolio, i.e.

[39] Simply taking a short position in the portfolio of the closed-end investment company is difficult and updating the short position continuously demands a lot of information and effort. Apparently, a successful arbitrage is most likely costly.

premiums. The following section includes a theoretical explanation for value effects due to diversification. The next section includes a presentation of the empirical evidence of value effects of diversification.

2.3.2.1 A model of investor beliefs, risk and uncertainty

One of the most intriguing contributions to the link between individuals' beliefs and the value of shares is provided by Miller (1977). Challenging the traditional assumption of homogeneous beliefs about future returns on securities, Miller argues:

> *"However, it is implausible to assume that although the future is very uncertain, and forecasts are very difficult to make, that somehow everyone makes identical estimates of the return and risk from every security." (Miller 1977, p. 1151)*

Instead he argues that due to an inelastic supply of shares in a firm, heterogeneous beliefs will raise the price on the shares of a firm[40,41]. This is because heterogeneous beliefs about the future prospects of a firm can be represented by a downward sloping demand curve. This is contradictory to the homogeneous beliefs situation where all investors share the same opinion about a firm. In such a case the demand curve for the shares of the firm is completely elastic at a certain value.

An individual investor may have different beliefs about different industries and/or companies. The investor will then most likely be overoptimistic about some companies and overpessimistic about others relative to the market value. The alternative to invest in a predetermined portfolio of shares is to buy each share at the open market at the quoted price. The investor will pay the market price for the shares the investor believes in and the investor will not buy the others. Consequently, the willingness to pay for a diversified company will be less than the willingness to pay for the sum of the shares in the parts of the diversified company. This conclusion is based on the

[40] Potentially short selling can alleviate the limited supply, but the degree of short selling is not always sufficiently large.

[41] Heterogeneous beliefs cause a downward sloping demand curve. The number of investors who find the shares attractive will increase when prices decrease. This is contradictory to the case with homogeneous beliefs where the demand curve is horizontal.

assumption that it is unlikely that investors with heterogeneous beliefs are willing to pay a high value for all firms in all industries. Consequently, heterogeneous beliefs are recognized to give rise to a negative price on diversification. Miller argues accordingly:

> *"A possible explanation for the low prices of conglomerates and closed end investment companies .... is that the typical investor finds that such investments are dominated by investments in a single industry, or related group of industries using whatever criteria he himself used for ranking. The preferred investments, of course, are not the same for all investors: depending on their evaluations of the potential returns a wide range of other companies may prove to be the preferred investment." (Miller 1977, p.1163)*

The arguments have been widely cited during the past ten years. Still, no applications of Miller's suggestions for the premiums on closed-end investment companies have been found.

2.3.2.2 Empirical evidence - value effects of general diversification

Empirical evidence on the effects of diversification on firm value must be collected from the research on conglomerates[42]. Empirical evidence of negative premiums due to diversification in conglomerates shows that low levels of diversification have substantial negative value effects, see below. If these findings can be extrapolated to the high levels of diversification observed in closed-end investment companies remains an open question.

Explanations for negative premiums on conglomerates are generally derived from the operating activities. The explanations concern overinvestment and cross-subsidization of poor performers[43]. None of these arguments are

[42] A conglomerate can be seen as company that provides diversification to its shareholders exactly like closed-end investment companies do. However, the level of diversification is lower in the conglomerates.

[43] Overinvestment refers to the situation where the supply of capital is high and the result is that the company engages in negative NPV projects in order to use the capital. Cross-subsidization refers to the case where profitable subsidiaries supply unprofitable subsidiaries with capital in order to make the latter survive.

readily applicable to closed-end investment companies. However, it should be noted that the explanatory power of these explanations have been low despite their significance. Possibly, the same valuation forces regarding diversification drive the negative premiums on conglomerates and closed-end investment companies.

Berger and Ofek (1995) is one of earliest empirical examinations on the impact of diversification on firm value. The focus of the study is the value effect of having more than one business segment. They also examine if intra-industry diversification have other value effects than cross-industry diversification has. Berger and Ofek find that multi-segment firms are traded at a negative premium of 13 to 15 %. They also conclude that cross-industry diversification is associated with more negative premiums than intra-industry diversification is. They show evidence of both overinvestment and cross-subsidization in their sample. The explanatory powers for multiple regressions are consistently below 10 %.

The study by Berger and Ofek was followed by a number of similar studies on the value of diversification in conglomerates. Servaes (1996) finds that a negative premium on diversification was present also during the beginning of the so called conglomerate era in the US in the 1960s. However, in contrast to the findings from the 1960s, he finds that the evidence of a negative premium is much weaker during the 1970s.

Many of the early studies used companies which have made internal diversification. In constrast, Klein (2001) uses a sample of acquisitive conglomerates. He concludes that the valuation of these companies show an opposite pattern from the findings provided by Servaes (1996). In Klein's study the acquisitive conglomerates show more negative premiums during the 1970s than they do during the 1960s. Klein partly attributes his findings to the successful creation of internal capital markets. However, according to Bhide (1990), the improvement of the external capital markets from the 1970s and onwards has eliminated the value improvement caused by internal capital markets. If this is accepted it can be argued that the evolution of the institutional setting may have a substantial impact on the valuation of diversification strategies over time.

Additionally, negative premiums due to diversification appear not to be limited to non-financial firms. Laeven and Levine (2005) show that diversified banks also exhibit significant negative premiums relative to the undiversified banks. The results are statistically significant, but of a somewhat smaller magnitude than for non-financial firms.

The studies referred to above have identified negative premiums and shown some evidence of a relationship with cash flow related variables. Theoretically, value effects can be caused by changes in expected cash flows and/or expected share returns. Expected share returns are furthermore a function of risk. Lamont and Polk (2001) examine the relative impact of cash flows and returns on the negative premiums due to diversification in conglomerates. They separate the variance of the excess value due to diversification into the variance of the excess dividend flows, variance of the excess returns on the conglomerate shares and the covariance between the two components. The benchmark for determining excess value, flows and returns are the levels for single-segment firms. Lamont and Polk conclude that approximately half of the negative premiums can be explained by the variance of share returns and the covariance between share return and cash flows[44]. These findings could be interpreted as an indication of higher required rates of return for diversified firms than for other firms. This in turn would suggest that firm diversification may increase shareholder risk rather than decrease shareholder risk which is normally assumed to be a primary objective for diversification.

Denis et al. (1997) discuss the implications of diversification in terms of agency theory. They suggest that diversification can be seen as an agency cost. They argue that diversification is one way to increase the manager's status and to make the manager indispensable for the company. The manager does not bear the cost of diversification as long as the manger does not have an ownership interest in the firm. As a result, diversification ought to be negatively correlated with management equity ownership. A similar argument is provided for outside blockholders[45]. Denis et al. document an expected negative correlation between the level of diversification and both management equity ownership and outside blockholders. However, they cannot establish a relationship between either management equity ownership or outside blockholders and the negative excess value due to diversification. Denis et al. claim that this suggests that increased ownership decreases the level of diversification, but it does not increase the value of diversification. Potentially the increased control exercised by management and blockholders

[44] The other half is explained by pure cash flows.

[45] An individual or a small group of individuals who owns a substantial proportion of shares in a firm is called a blockholder.

when ownership increases may increase the agency costs and decrease value. This is so until the marginal cost incurred by management and/or blockholders exceeds their marginal benefits. This interpretation is not elaborated on by Denis et al.

The empirical evidence from research on conglomerates and multi-segment firms provides strong evidence of a negative premium due to diversification. Proposed explanations for negative premiums generally concern intra-group allocation of funds (cross-subsidization) and overinvestment. These presumed explanations for diversification are difficult to apply to closed-end investment companies. The investment companies do not generally own sufficiently large stakes in other firms to apply such managerial control. Some of the largest Swedish closed-end investment companies are, however, exceptions to the general observation.

The increased return from diversified firms traded at a negative premium supports a risk interpretation. The increased return is not immediately compatible with the explanations suggested by Miller (1977).

2.3.2.3 Empirical evidence – value effects of diversification with market restrictions

Closed-end investment companies can provide access to otherwise restricted markets through diversification. This is particularly so when the capital markets are underdeveloped or when international restrictions apply to foreign investments. The value of access to foreign restricted capital markets has been investigated using premiums on closed-end country funds. In this framework investors are expected to be willing to pay a premium on these companies in order to obtain additional diversification from overcoming the restrictions[46]. Accordingly, premiums should decline when investment restrictions are reduced. This argument assumes that the value to foreigners is higher than the corresponding to local investors, who set prices.

Bonser-Neal et al. (1990) perform an event study focusing on the premium effect of the announcement of changes in foreign investment restrictions. They conclude that in most cases there is a significant drop (increase) in premiums around the date of the announcement of a loosening (tightening)

[46] A closed-end country investment company is a closed-end investment company that specifically invests its funds in a pre-specified country or region.

of the restrictions. The average decline in premiums during the three weeks surrounding the announcement is 6.8 percentage points.

Bekaert and Urias (1996) examine the mean-variance properties of the returns on American and British closed-end country investment companies relative to different benchmarks. A lower variance of returns given the level of returns relative to the benchmark indicates diversification benefits. Bekaert and Urias find that British closed-end country investment companies provide their investors with significant diversification benefits. The findings for the American companies are less strong. Based on empirical evidence, the authors suggest that differences in portfolio holdings are more likely to explain the divergent results than a difference in premium reactions. In other words, they suggest that the actions taken by the managers may be systematically different between the two countries. UK managers may be different from US managers and that difference in behavior is more likely to drive the result than the market behavior.

The findings from these studies suggest that closed-end investment companies can serve as financial intermediaries that provide investors with diversification benefits. The possibility to access otherwise restricted markets is appreciated by the investors and rewarded with higher premiums.

2.4 Ownership structure and agency costs

The findings by Denis et al. (1997) above lead the attention towards the impact on premiums by the ownership structure and agency costs. The literature on ownership structure and agency costs has two parts: a theoretical part and an empirical part. These two parts are discussed separately with an emphasis on the empirical evidence. Table 2.3 lists the articles discussed in this section.

2.4.1 The theoretical arguments

The effects of the separation between ownership and control have been researched extensively during the past four decades. The potential problems due to the separation were recognized much earlier. Berle and Means (1932,

1968) discuss the conflict of interest between owners and a management team exercising control over a firm, arguing[47]:

> *If we are to assume that the desire for personal profit is the prime force motivating control, we must conclude that the interests of control are different from and often radically opposed to those of ownership; that the owners most emphatically will not be served by a profit-seeking controlling group. In the operation of the corporation, the controlling group even if they own a large block of stock, can serve their own pockets better by profiting at the expense of the company than by making profits for it. (Berle and Means, 1968, p. 114)*

The risk for diversion of funds from the company by the controlling party constitutes the core issue in the vast literature on agency theory and its empirical application. The formalization of the theory starts with the seminal paper by Jensen and Meckling in 1976. In this paper the authors show that the management team has an incentive to indulge in activities that are personally beneficial, but non-optimal for the firm. This situation emerges as soon as a shareholder owns less than 100 % of the shares in a company. Two kinds of agency situation are particularly identified in the literature. First, the management team may be external to the firm *and* the shareholders are dispersed. Second, a large but not sole shareholder may exercise the combined role of shareholder and management team. This latter case is further accentuated when the firm has issued shares with different voting rights, which is discussed in section 2.4.1.3.

Under this framework extensive monitoring and proper incentives are seen to be required in order to limit harmful behavior by the management team. Monitoring can be achieved either by the shareholders (or their appointee) or by another group of actors with a financial interest in the firm. Jensen and Meckling argue that banks and bondholders can effectively serve as monitors to the benefit of the shareholders. However, the incentives for non-shareholders to monitor are effectively limited due to bankruptcy and corporate law. These laws are largely designed to protect non-shareholders, who then do not need to monitor the management as fiercely. Moreover, note that closed-end investment companies are seldom financed with debt.

[47] The reference is from 1968. This is a reprint with a few additional comments in two forewords by the original authors.

Authors	Published	Sample origin	Sample size	Sample period	Examined explanations[i]
Berle & Means	1968 (1932)		Argumentative		Management – owner conflict leads to agency costs
Jensen & Meckling	1976		Theoretical		Identity between majority owner and management, conflict with minority owners
Fama & Jensen	1983a		Argumentative		Detailed discussion about the relationship between owners and management emphasizing problems
Fama & Jensen	1983b		Argumentative		Detailed discussion about the relationship between owners and management emphasizing problems
Jog & Riding	1986	Canadian	62 firms	1976 – 1984	Difference in value of shares with high and low voting rights respectively. Appears immediately after issuance.
Foerster & Porter	1993	Canadian	36 firms	1980 – 1987	No return difference but a value difference between shares with high and low voting rights respectively.

Table 2.3: Summary of studies on ownership structure and agency costs in chronological order

[i] Sign indicates sign of a statistically significant relationship with premiums or the theoretical prediction. 0 means no statistical significance.

Barclay, Holderness & Pontiff	1993	US	138 equity and bond	1979, 1984 and 1989	Blockholders equity CEICs (-) bond CEICs (0) Premiums more sensitive to expenses with blockholders
Norohna & Rubin	1995	US	Only bonds	1980 – 1990	Blockholders bond CEICs (0)
Hart	1995		Theoretical		Sufficient monitoring and detailed contracting is difficult due to imperfections
Prior	1995	UK	17 equity	1970 – 1988	More institutional ownership in UK over time, unnecessary expenses more likely, less share price volatility with high institutional ownership
Smith & Amoako-Adu	1995	Canadian	81 firms	1981 – 1992	Price premium of shares with high voting rights is due to an expected merger premium.
Sias	1997	US	5 equity 9 bond	Nov 1990 – Jan 1991	Less institutional ownership in the US than in the UK. Active institutional owners.
Coles, Suay & Woodbury	2000	US	81 combined equity and bond	1978 – 1991	US management teams may manage many CEICs. High proportion of funds in a specific CEIC result in lower relative expenses, less agency costs. Either high costs or focus limits agency problems.

Table 2.3 cont.: Summary of studies on ownership structure and agency costs in chronological order

Chandar & Bricker	2002	US	48 equity 62 bond	1990 – 1996	Earnings management for unquoted securities, compensation maximization by directors
Khorana, Wahal & Zenner	2002	US	120 equity and bonds	1988 – 1998	High advisor compensation and broker and advisor affiliated results in more negative returns after a rights offering.
Claessens, Djankov, Fan and Lang	2002	East-Asian	1 301 firms	1996	Value is positively related to percentage of capital held by largest investors. Use of shares with different voting rights decreases value.
Del Guercio, Dann & Partch	2003	US	134 equity 342 bond	1994 – 1996	Proportion of independent directors negatively related to expenses. Board size increase expenses. Nominating committee (+)
Cronqvist & Nilsson	2003	Swedish	309 firms	1991 – 1997	Controlling shareholders drives negative value effects, proposed to be agency costs.
Holmén & Högfeldt	2005	Swedish	13 equity	1986 – 2000	Value of pyramids. Overinvestment rather than tunneling as negative premium drivers.

Table 2.3 cont.: Summary of studies on ownership structure and agency costs in chronological order

Hart (1995) argues that sufficient monitoring and proper incentives originating from the shareholders are difficult to obtain for at least two reasons. First, monitoring has the characteristic of a public good. All non-influential shareholders obtain the benefits, but who is going to initiate and pay for the monitoring. This is one of the major problems with a dispersed ownership structure. If there are large shareholders in the firm, they may have the least to lose from initiating effective monitoring. Large shareholders seize a substantial part of the benefits and they may then be willing to take the cost. However, large shareholders may themselves seize control by taking over the management role or by cooperating with current management[48,49]. If this is so, the agency costs are at best unchanged. Both of these situations are present on the British and Swedish markets for closed-end investment companies.

Second, according to the agency literature, proper incentives are to be obtained through carefully designed contracts between the principal and the agent. Costs associated with contracting combined with the impossibility to completely foresee all possible future events make contracts incomplete. Incomplete contracts reduce the effectiveness of the entire contracting procedure and thereby the potential gains.

Theoretical reasoning suggests that agency costs are to be expected when ownership and control are separated. The magnitude and structure of these costs are difficult to determine through theoretical modeling. Two categories of empirical research on the subject can be identified. The first category contains evidence on the effects on closed-end investment company premiums due to ownership structure. The second category contains evidence on the effects on prices of shares with differential voting rights. This latter category relies exclusively on data from other firms than closed-end investment companies.

[48] Potentially, there is a difference between large institutional (e.g open-end funds and insurance companies) and individual investors with respect to control ambitions. Institutional investors have a larger portfolio to manage and they may then be less prone to seizing power in an individual company. A more focused individual investor with only a few important holdings may have stronger incentives to seize power in order to gain from the agency situation.

[49] Detailed discussions of the interactions between residual claimants (shareholders) and the decision process controlled by the agents are provided by Fama and Jensen (1983a, 1983b).

2.4.2 Empirical evidence – premiums and ownership structure

Empirical investigations of the effects of ownership structure on closed-end investment company premiums can be divided into two main categories. Within the first category, the objective is to investigate a relationship between the existence of blockholders or certain investor groups and premiums. Research on the effects of suggested agency related behaviors of different groups of shareholders is also included. The second category includes research on relationships between the level of expenses, ownership structure and other indicators of an agency situation. Abnormally high expenses are seen as the agency costs incurred by the (minority) shareholders. The expenses are assumed to affect premiums negatively. Few explicit studies of the relationship between additional agency expenses incurred and premiums are identified.

One of the earliest contributions to the category of linking ownership structure to premiums is Barclay et al. (1993). They document a negative impact on premiums of 7.0 percentage points for the closed-end investment companies investing in equities when blockholders are present. For closed-end investment companies investing in bonds, the impact is almost zero[50]. A negligible impact on the premiums of closed-end investment companies investing in bonds is documented again by Norohna and Rubin (1995)[51].

Barclay et al. argue that the negative impact from blockholders on the companies investing in equities is constant over time. However, their findings suggest that the magnitude of the impact on premiums is less when premiums are already high.

Barclay et al. claim that the reason for the negative premium effect is that blockholders obtain private benefits. They identify three categories of benefits: direct pecuniary benefits, other pecuniary benefits and non-pecuniary benefits[52]. The direct pecuniary benefits are the largest group.

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[50] Note that the number of closed-end investment companies with a portfolio of bonds that have blockholders is very small.

[51] Norohna and Rubin suffer from the same low levels of blockholders as Barclay et al do.

[52] Pecuniary benefits are normally salary and or management fees. Other pecuniary benefits include monetary interactions between companies where the owner to the

Excess expenses incurred by the company are to be seen as a wealth loss to the other investors. In order to test this, the authors check the sensitivity of premiums to expenses when blockholders are present. They find that the sensitivity to expenses is much higher when blockholders are present.

Another aspect of the agency approach and blockholders concerns the relative impact on premiums of different groups acting as blockholders. In this context changes in ownership structure over time become particularly intriguing. Prior (1995) shows that the proportion of institutional ownership in British closed-end investment companies has increased dramatically from 1964 to 1986. The sample is small but indicates a change from 75 % - 25 % in favor of individual investors to the same proportion in favor of institutional investors. Prior argues that institutional investors have less to gain from external portfolio management. As a result management expenses are considered an agency cost. From this point of view, an agency cost is seen as a cost that is unnecessarily incurred by the principal given the principal's abilities.

Additionally, the existence of a large proportion of institutional investors can affect the premium volatility. The volatility is expected to be lower since institutional investors more easily can replicate the underlying portfolio. The volatility is an additional risk to the institutional investors, which they try to eliminate. As an effect, less volatile and more mean-reverting premiums are expected. Prior documents both low volatility and a more distinct mean-reversion pattern when the proportion of institutional investors is high.

Sias (1997) presents American evidence on the effective influence of institutional investor. The findings are similar to the findings provided by Prior on UK data. American closed-end investment companies have on average a much lower proportion of institutional ownership than the British companies[53]. Despite this, institutional owners account for 32 % of the trading volume on average. In terms of setting prices and premiums, Sias thus concludes that institutional investors are as important as individual investors in setting prices.

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closed-end investment company and the other company is similar. Non-pecuniary benefits include names and family tradition.

[53] Average proportion of institutional ownership in American closed-end investment companies is less than five percent. The control sample of open-end investment companies has an average of 30 % institutional ownership.

The second category of agency based explanations concerns the relationship between expenses and various indicators of an agency relation. A number of studies have been presented during the 2000s within this category. In this literature two roles are identified as being of key importance: the focus and cost of the management team and board of directors respectively. Coles, et al. (2000) examine the management team and Del Guercio et al. (2003) examine the board of directors.

Coles et al. (2000) investigates the level of management expenses and the relative proportion of funds under the manager discretion that is attributable to a particular company. The higher the proportion, the more focused the manager is expected to be on the management of the particular company. They find that the percentage compensation rate to fund managers decreases with the focus of the managers in the particular closed-end investment company.

Coles et al. define a measure called the effective marginal compensation rate. This is the proportion of funds as described above times the percentage compensation rate. The measure captures two aspects that should increase the incentive for the management team to focus on the particular closed-end investment company. These are the size of the company and the compensation rate obtained[54]. The premiums are showed to increase with the effective marginal compensation rate. The authors conclude that when advisor's and owner's incentives/preferences are better aligned the effective marginal compensation rate is higher. This is a strong indication of agency effects on the premiums. The more aligned the incentives for the management team are with the shareholders' demands for returns, the higher is the premium.

Del Guercio et al. provide evidence of the governance and monitoring role of the boards of directors in closed-end investment companies. In the study the two most revealing measures of board effectiveness are found to be the size of the board and proportion of independent directors on the board. Del Guercio et al. show that fund expenses increase with board size and decrease with the proportion of independent directors[55]. When the board

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[54] Note that the compensation rate may change depending on the size of the company.

[55] Measures of the relationship between directors and other closed-end investment companies managed by the same advisor group also show that independence leads to lower expenses.

characteristics are linked to premiums the relationships are different. Board size is negatively related to premiums as expected. Independent directors appear to have no impact on premiums. However, the results suggest that a nominating committee for the board of directors has a positive impact on premiums. Such a nominating committee could be seen as an assurance for independence and effectiveness.

The findings by Coles et al. and Del Guercio et al. suggest that effective monitoring and alignment of incentives are important in the pricing of closed-end investment companies. The findings support the suggestion that there are direct monetary effects of ineffective monitoring and alignment of incentives. The effect of such inefficiencies on premiums is not entirely consistent with the findings on the effects on expenses[56]. This lack of consistency suggests that the monitoring and alignment of incentives may have non-monetary characteristics that also affect premiums.

The agency behavior of managers and directors is further documented in two studies from 2002. Chandar and Bricker (2002) report evidence of earnings management with respect to the valuation of restricted/unquoted securities. They suggest that this behavior is consistent with personal long term compensation maximization by the directors. Khorana et al. (2002) examine rights offerings in closed-end investment companies. These offerings are all made at a premium. Khorana et al. show that the premium decline subsequent to the rights offering is more severe when the compensation to advisors is high and when the broker is affiliated with the advisors.

2.4.3 Empirical evidence – value effects of shares with different voting rights

The difference in value between shares with different voting rights is not necessarily relevant to premium levels. However, if different voting rights drive higher agency costs, a significant relationship with premiums can be expected. The core of the argument for a significant relationship between different voting rights and premiums lies in the control aspect of the superior voting rights. The controlling aspect of a sufficiently large block of shares

[56] Premiums are not as consistently related to the applied measures as the expenses are.

with superior voting rights could result in a price premium[57]. British closed-end investment companies have not used shares with different voting rights[58]. The Swedish companies, however, have used such shares extensively. This is particularly so for the largest Swedish companies. The existence of shares with different voting rights may then explain differences between Swedish and British companies.

The substantial empirical evidence on the value effects of differential voting rights gives strong support for a considerable premium on shares with superior voting rights relative to shares with less voting rights. The phenomenon is consistent across capital markets around the world.

Early studies of the value differences of shares with different voting rights are performed on Canadian data. Jog and Riding (1986) investigate the value effects at the issuance of restricted voting shares in companies which previously only had one class of shares on the Toronto Stock Exchange. They find a distinct difference in the value of restricted and superior voting rights shares. The difference appears immediately at the point of issuance. They also find that the long term difference in value amounts to approximately seven percent in their sample.

Foerster and Porter (1993) build on the findings by Jog and Riding using Canadian data by investigating the price difference independent of the date of issuance. They document that in over 80 % of the cases shares with superior voting rights are traded at a premium to the shares with restricted voting rights. Foerster and Porter also examine if there is a return difference between shares with restricted and superior voting rights. No indication of such a return difference is identified. The findings would imply no increase in systematic risk for shares with restricted voting rights. According to conventional theory, the value difference would then be driven by excess cash flows to the holders of the shares with superior voting rights.

[57] This also means that shares with superior voting rights may not trade at a premium to the shares with restricted voting rights. This is so if the traded shares with superior voting rights are too few to have a controlling influence on the company. Still, the existence of dual class shares may cause negative premiums on the quoted and traded shares.

[58] Multiple classes of shares with other attributes have been used by the British companies.

The findings by Jog and Riding and Foerster and Porter with respect to voting rights are supported by Smith and Amoako-Adu (1995). Furthermore, Smith and Amoako-Adu present evidence that the premium is related to an expected price premium on shares with superior voting rights at the time of a future merger with another company. Such evidence supports the agency arguments for price differentials.

Cronqvist and Nilsson (2003) examine the agency costs of controlling minority shareholders. Within their Swedish sample, 75.7 % of the firm-year observations are cases where shares with different voting rights exist. Cronqvist and Nilsson use the effects on Tobin's q to measure the impact from percentage of votes and the votes-to-capital ratio held by the controlling owner[59]. They find a strong and consistent relationship between value and the percentage of votes[60]. Under the assumption that high a percentage of votes drives agency cost, they conclude that the value impact due to agency costs amount to 6 – 25 % of firm value depending on the character of the controlling owner. Additionally, Cronqvist and Nilsson show evidence that a part of the agency costs are due to inferior performance by the firms when there is a controlling owner.

From an ownership perspective the companies listed on the East-Asian capital markets show certain similarities with the set of Swedish closed-end investment companies. The proportion of companies with shares with restricted voting rights is non-negligible. The proportion of companies that are controlled by a family or a small group of individuals is large. Claessens et al. (2002) study the value effects of ownership concentration in East-Asian companies. They conclude that ownership concentration measured as the proportion of capital held by the controlling shareholder is positively related to share prices. They conclude that when the largest shareholder has a substantial interest in the residual cash flow from the firm the incentives of the large controlling shareholders are also aligned with the incentives of minority shareholders. This is consistent with the predictions by Jensen and Meckling (1976). Dual class shares give the opportunity to

[59] The votes-to-capital ratio is the percentage of votes to the percentage of capital provided by the relevant owner of owner group.

[60] The votes-to-capital ratio shows no significant relationship with value. The lack of a significant relationship with premiums for the votes-to-capital ratio may be caused by the high degree of firms with shares with different voting rights in the sample. Moreover, the percentage of votes held by the controlling owner may be strongly correlated with the votes-to-capital ratio.

control a company with only a limited contribution of capital. Claessens et al. test the value effects of the excess control obtained through dual class shares. They find that there is a significantly negative effect on share value for firms with dual class shares.

Claessens et al. examine two additional features: the shape of the relationship between excess control and value *and* the impact of the characteristics of the owner group in control. With respect to the first feature, their findings suggest that high levels of excess control increase the marginal effect on value. This suggests that there is a non-linear relationship between excess control and value. With respect to the characteristics of the owner group, Claessens et al. show that family controlled firms with dual class shares suffer much greater value losses than other firms. This suggests that the agency costs incurred by the minority shareholders are larger due to the tight control and identity between the majority owner and the management team.

Holmén and Högfeldt (2005) examine the value effect and explanations for the value effects on Swedish pyramids. These pyramids are constructed using superior voting rights shares to control firms further down in the pyramid. Closed-end investment companies are used as the holding company at the top of the pyramid to control the included firms.

Holmén and Högfeldt conclude that closed-end investment company premiums are strongly related to the difference between voting and capital share held by the largest investor/investor group[61]. They show that for each excess percentage point in voting share to capital share the premium decrease with half a percentage point. On average the closed-end investment companies with above median excess voting share to capital share have premiums that are 10.5 percentage points lower than closed-end investment companies with below median excess voting share.

Holmén and Högfeldt also show that the longer the currently controlling investor group has been in control the lower is the premium[62]. An interpretation of this finding is that minority shareholders (by the measure of voting share) conclude that the current structure will prevail in the future. As a result the control over investment decisions, portfolio composition and

[61] This is the same definition as the sphere that is used in later chapters.

[62] Holmén and Högfeldt find similar structures and value effects on the portfolio companies. This is outside the scope of this document.

remuneration etc are seen to be impossible to affect. The expected lack of influence by the minority shareholders is compensated by negative premiums.

The empirical evidence based on the existence of dual class shares and controlling minority shareholders show strong indications of a negative price effect for the non-controlling owners. There are also findings that suggest value effects depending on whom the controlling owner is. The agency aspects of control are consistent with these findings.

2.5 Conclusions

Previous research has contributed substantially to the understanding of the behavior of and determinants for the premium on closed-end investment companies. The bulk of research is conducted using American data. The British closed-end investment companies have been examined to a certain degree but evidence from other markets is limited.

The contributions have in many cases established only limited relationships between proposed determinants and premiums. This is particularly so for the traditional economic explanations based on discounted cash flows. The returns on net asset value, administrative expenses and taxes have only irregularly shown empirical relationships with premiums. The lack of evidence concerning the intuitively most appealing explanation, administrative expenses, is remarkable. Despite the non-existing empirical evidence of a relationship between administrative expenses and premiums, the theoretical explanation remains and it is fiercely defended.

An explanation for the lack of explanatory power for the return on net asset value is the documented very weak persistence in performance. No research has been identified on the performance of different parts of the portfolio of securities. The need for very detailed information may be the reason for the lack of research.

The behavioral financial economists have provided us with evidence of the existence and impact of different investor groups in the market for closed-end investment company shares. The behavior of individual investors appears to affect premiums. However, the driver behind the behavior of individual investors remains unclear.

The behaviorists have also argued that individual investors incur additional risk which is not diversifiable. The empirical evidence on this matter is not conclusive.

The research on conglomerates shows that the value effect of diversification by companies is negative. The concept of diversification has not been explicitly studied in the context of closed-end investment companies. As argued in chapter one, the concept of diversification is based on two fundamental questions regarding the existence of closed-end investment companies. Do investors buy general diversification or stock picking expertise by the management team? Do investors have specific opinions about individual shares?[63] The evidence from conglomerates suggests that investors prefer a focused strategy. If this can be translated to closed-end investment companies, the interpretation is that stock picking expertise is preferred. One case has been identified in previous research where diversification is preferred. When stock markets are highly regulated and inaccessible to individual investors, closed-end investment companies can serve as the means to obtain diversification benefits. Positive premium effects have been documented when closed-end investment companies serve as door openers to restricted markets. The second question remains unanswered.

Finally, one interpretation of the existence of different investor groups is the relationship between majority and minority shareholders. Individual investors tend to be an unorganized mass of investors with minimum practical influence. In such cases agency situations occur. The general agency case with a large number of small shareholders and a management team is applicable. The situation becomes worse when there is a union between the majority shareholders and the management team. Empirical evidence from closed-end investment companies and other firms shows that ownership structure influences prices. Additionally, concentrated ownership combined with limited financial responsibility by the owners in control appears to have a severe negative impact on prices. The empirical evidence from closed-end investment companies is limited with respect to this case.

[63] Note that the two questions are not mutually exclusive.

Part two Theoretical modeling, empirical design and statistical predictions

Part two contains three chapters, chapter three through five, in which the statistical models are derived from theoretical foundations. The fundamental structure of the statistical models is derived from the residual income framework in chapter three. Amendments to the framework are made based on theories on diversification and agency costs.

Chapter four contains the operationalization of the theoretical concepts included in the statistical models. The fundamental structure of the statistical models is adjusted by adding a different functional form to the independent variables.

Chapter five contains a discussion of the institutional setting in which the closed-end investment company works. Similarities and differences between the British and Swedish settings are discussed. The fundamental structure of the statistical models is refined in two ways. First, the impact of regulation on diversification is specifically tested in the models. Second, the models are run separately for two overlapping time periods due to dramatic changes in the institutional setting.

The structures of the empirically tested models are presented at the end of chapter five, page 137.

3 From theory to statistics – the traditional framework, the amendments and the statistical predictions

In this chapter the theoretical valuation framework is presented. The valuation framework is based on the residual income model as derived by Preinreich (1938), Edwards & Bell (1961) and Ohlson (1995). The core model and the refinements necessary for the task of analyzing premiums on closed-end investment companies are provided in 3.1. The value generating process is then divided into two parts: the value generated by the portfolio of quoted and unquoted securities respectively. The presentation of adjustments due to the separation of the two portfolios is the core of section 3.1. A short presentation of the residual income model is provided in section 3.1.1. The derivation of the separation of the two portfolios is provided in section 3.1.2.

The valuation model discussed here is only one component of the final regression models. Amendments to the regression model are based on predictions from the literature on portfolio diversification/concentration and ownership structure. These amendments are presented in section 3.2. In section 3.3 the theoretical framework is converted into a statistical model. The statistical model is based on certain regularity conditions to be able to achieve a parsimonious model. The conditions and the effects of the conditions on regression parameters are discussed. Expected values of regression parameters are examined under the assumption that unbiased estimates of future value creation are used in the model. The notation in the chapter is structured as follows: ratios are written in capital letters and variables measuring values are written in lower case letters.

3.1 The residual income model

The basis for the theoretical model used in this project is the residual income model. One of the earliest contributions to the model is Preinreich (1938). Over the years, the model has been further developed by e.g. Edwards &

Bell (1961), Ohlson (1995), Feltham & Ohlson (1995), Ohlson, (2005) and Skogsvik, (2006).

3.1.1 The earnings based model

The standard residual income model depends on four assumptions.

A:1 The value of an asset is the present value of its net cash flows. In the case of a share in a company, the cash flows are the net dividends[64].
A:2 The clean surplus relation holds[65].
A:3 Dividends and capital contributions from owners are marked to market.
A:4 The risk of bankruptcy is negligible.

The general structure of the model is[66,67,68]:

$$V_0 = \text{nav}_0 + \sum_{t=1}^{\infty}\left[\left(\prod_{\tau=1}^{t}(1+r_{E,\tau})\right)^{-1} \times E_0\left[\tilde{x}_t^a\right]\right] \tag{3.1}$$

The intrinsic value of net assets at the valuation date	=	The net asset value at the valuation date
	+	The present value of expected residual earnings from period 1 onwards

the valuation date is normalized to be time 0
nav_0 = net asset value ex dividend and capital contribution at the valuation date
$r_{E,\tau}$ = the required expected rate of return on equity in period τ
$E_0[.]$ = expectation operator conditioned on the available information at date t=0
$\tilde{x}_t^a = \tilde{x}_t - r_{E,t} \times \text{nav}_{t-1}$ = residual earnings in period t
$\tilde{x}_t$ = comprehensive earnings in period in period t

64 Net dividends are defined as dividends less capital contributions from owners.
65 The clean surplus relation states that changes in net asset value between to points in time are explained by net dividends and earnings during the period.
66 A derivation of the model is provided in appendix 3.1.
67 Note that net asset value (nav) is here used instead of book value of owners' equity (bv), which is the standard notation.
68 It is necessary to add two parameter restriction to obtain a bounded solution, $\left(\prod_{\tau=1}^{t}(1+r_{E,\tau})\right)^{-1} \times E_0\left[\tilde{x}_t^a\right] < \infty$ for all t and $\left(\prod_{\tau=1}^{T}(1+r_{E,\tau})\right)^{-1} \times \text{nav}_T \to 0$ when $T \to \infty$.

Residual earnings consist of two components: the ordinary earnings that satisfy the clean surplus relation and a capital charge based on the required rate of return on net asset value times the net asset value at the beginning of the period. The residual earnings can be seen as the earnings that constitute value creation. The future value creation is thus expressed as the spread between the market value and the net asset value.

The model displayed in equation 3.1 is generally valid but one practical complication still exists. It is very difficult to make long term forecasts of future residual earnings. This is handled by introducing a valuation horizon. The expression for the present value of the residual earnings subsequent to the horizon is exchanged for the value of those residual earnings. This value is represented by the spread between the market value of equity and the net asset value.

$$\mathrm{V_H} - \mathrm{nav}_H = \sum_{t=H+1}^{\infty} \left(\prod_{\tau=H+1}^{t} \left(1 + r_{E,\tau}\right) \right)^{-1} \times E_0\left[\tilde{x}_t^a\right] \tag{3.2}$$

H = the valuation horizon date/period ($H < \infty$)

3.1.2 The return and growth based model

The original representation of the residual earnings is a measure combining two effects, profitability and growth. There is a substantial dependence between profitability and growth. They are only separated by the financing and dividend policy of the company. However, in order to analyze the origin of residual earnings, it is preferable to distinguish between residual return (profitability) and accumulated growth measured as the level of net asset value. Equation 3.3 shows the model using a valuation horizon and the use of residual returns and net asset value levels.

$$\begin{aligned} V_0 = \mathrm{nav}_0 &+ \sum_{t=1}^{H} \left[\left(\prod_{\tau=1}^{t} \left(1 + r_{E,\tau}\right) \right)^{-1} \times E_0\left[\left(\mathrm{RN\tilde{A}V}_t - r_{E,t}\right) \times \mathrm{n\tilde{a}v}_{t-1}\right] \right] + \\ &+ E_0\left[\tilde{V}_H - \mathrm{n\tilde{a}v}_H\right] \times \left(\prod_{\tau=1}^{H} \left(1 + r_{E,\tau}\right) \right)^{-1} \end{aligned} \tag{3.3}$$

The intrinsic value of net assets at the valuation date	=	The net asset value at the valuation date
	+	The present value of residual earnings expressed in terms of residual returns to the valuation horizon
	+	The present value of the expected excess value of equity at the horizon date

$$\mathrm{RNAV}_t = \frac{\text{Net earnings}_t}{\text{Net asset value}_{t-1}} = \text{return on net asset value in period t}$$

The model is now changed to obtain a measure of the premium relative to net asset value. As stated before, premium is used as the generic term for both positive and negative deviations from net asset value. By subtracting and dividing both sides of the model with net asset value at the valuation date, the underlying premium model is derived. The model is shown in equation 3.4.

$$\begin{aligned}\text{Premium}_0 = {} & \sum_{t=1}^{H}\left[\left(\prod_{\tau=1}^{t}(1+r_{E,\tau})\right)^{-1} \times E_0\left[\left(\mathrm{RN\tilde{A}V}_t - r_{E,t}\right)\times \tilde{G}_{t-1}\right]\right] + \\ & + E_0\left[\mathrm{Pre\tilde{m}ium}_H\right]\times \tilde{G}_H \times \left(\prod_{\tau=1}^{H}(1+r_{E,\tau})\right)^{-1}\end{aligned} \qquad (3.4)$$

The intrinsic premium on net asset value at the valuation date	=	The present value of the expected abnormal returns on net asset value from period 1 to the valuation horizon
	+	The present value of the premium at the valuation horizon

$$\tilde{G}_t = \frac{\mathrm{n\tilde{a}v}_t}{\mathrm{nav}_0} = \text{cumulative growth rate in net asset value from time 0 to time t}$$

3.1.3 Decomposition of $RNAV_t$

The net asset value and the return on net asset value consist of several components. Decomposition of the measures can be made in many different ways depending on the purpose of the analysis. In this context a decomposition of the asset side of the balance sheet based on net quoted and net unquoted securities is made. The sub-portfolios of net quoted and net unquoted portfolios hence constitute total net operating assets.

	Modified balance sheet	
Net operating assets (noa)	Net quoted securities (nqs)	Net asset value (nav)
	Net unquoted securities (nus)	Net financial liabilities (nfl)

Modified income statement

Operating earnings from quoted securities before administrative expenses
+ Operating earnings from unquoted securities before administrative expenses
= Operating earnings before administrative exp
-Administrative expenses
= Operating earnings
+ Financial revenues
- Financial expenses
= Earnings before taxes
- Taxes
= Net earnings

Figure 3.1: Modified accounting reports for closed-end investment companies

net operating assets = operating assets – operating liabilities
net financial liabilities = financial liabilities – financial assets

The financing side of the balance sheet is decomposed into net asset value and net financial liabilities. From an analytical perspective the income statement has to be arranged in a consistent manner. Operating earnings are divided into operating earnings from quoted and unquoted securities respectively. Earnings from the two kinds of securities are determined before administrative expenses have been charged. Administrative expenses are then subtracted separately. Taxes are analyzed as one component[69]. The modified balance sheet and income statement are presented in figure 3.1.

The structures of the balance sheet and income statement fin figure 3.1 enable a decomposed analysis of the return on net asset value. Return on net asset value can be analyzed by decomposing it into operating profitability before administrative expenses, the additional return margin from borrowing and the deductions due to administrative expenses and taxes[70].

$$\mathrm{RNAV}_t = \left[\mathrm{RNOA}_t + \left(\mathrm{RNOA}_t - \mathrm{RNFL}_t\right)\frac{\mathrm{nfl}_{t-1}}{\mathrm{nav}_{t-1}} \right] - \mathrm{RRC}_{\mathrm{tax},t} - \mathrm{RRC}_{\mathrm{adm},t} \quad (3.5)$$

The return on net asset value in period t	=	(The return on net operating assets before administrative expenses in period t
	+	The return margin on net financial liabilities in period t
	×	The net financial liability to net asset value ratio at date t-1)
	-	The net asset value based return from administrative expenses in period t
	-	The net asset value based return from taxes in period t

The relationship is based on the following definition of returns on the three balance sheet items:

$$\mathrm{RNOA}_t \equiv \frac{\text{Operating earnings before administrative expenses}_t}{\text{Net operating assets}_{t\text{-}1}} = \quad (3.6)$$

$$= \text{Return on net operating assets in period t}$$

$$\mathrm{RNFL}_t \equiv \frac{\text{Financial expenses}_t \text{ - Financial revenues}_t}{\text{Net financial liabilities}_{t\text{-}1}} = \quad (3.7)$$

$$= \text{Return on net financial liabilities}$$

[69] Consequently taxes are not divided into taxes on the operating activities and financial side-effects which is done in other valuation models.

[70] Such a decomposition is well-known and used in many standard books on financial statement analysis, e.g. Johansson & Runsten (2005). The decomposition used here is only a rearrangement of the standard version.

$$\mathrm{RRC}_{\mathrm{adm},t} \equiv \frac{\text{Administrative expenses}_t}{\text{net asset value}_{t-1}} = \tag{3.8}$$

= Residual return contribution from administrative expenses in period t[71]

$$\mathrm{RRC}_{\mathrm{tax},t} \equiv \frac{\text{Taxes}_t}{\text{Net asset value}_{t-1}} = \tag{3.9}$$

= Residual return contribution from taxes in period t

A similar decomposition can be made with regard to the required rate of return based on the Modigliani and Miller proposition I (Modigliani and Miller, 1961)[72]. The required rate of return on equity/net asset value is the sum of the required rate of return on the unlevered company and the additional requirement due to leverage. This additional leverage component is the spread between the unlevered required rate of return and the market based borrowing rate times the debt-to-equity ratio in market value terms.

$$r_{E,t} = r_{u,t} + \left(r_{u,t} - r_{ND,t}\right)\frac{ND_{t-1}}{E_{t-1}} \tag{3.10}$$

The required rate of return on equity in period t	=	The required rate of return on the unlevered company in period t
	+	The spread between the required rates of return on the unlevered company and its net debt in period t
	×	The net debt to net asset value ratio at market values in period t-1

$r_{u,t}$ = required rate of return on the unlevered company in period t
$r_{ND,t}$ = required rate of return on net debt (net financial liabilities) in period t
$\frac{ND_t}{E_t}$ = the net debt - to - equity ratio of the company at market value in period t

Given the relationships above, it is possible to obtain a decomposed and simple expression for the residual return on equity. By merging expressions

71 The notation RRC standing for residual return contribution is an adjustment to the final structure of the model presented later.

72 Further discussion about appropriate cost of capital measures under different capital structures and tax regimes are provided by Harris and Pringle, 1985, Taggart Jr., 1991 and Ruback, 2002.

(3.5) and (3.10), an expression for residual returns is obtained. The residual return on net asset value can be explained by the levered residual return on operating assets, the residual return from net financial liabilities, administrative expenses and taxes. A small component called the aggregation error emerges due to the difference between the market value and balance sheet based values of net debt and net asset value.

$$\mathrm{RRC}_{\mathrm{nav,t}} = \mathrm{RR}_{\mathrm{noa,t}} \times \left(1 + \frac{\mathrm{nfl}_{\mathrm{t-1}}}{\mathrm{nav}_{\mathrm{t-1}}}\right) - \mathrm{RR}_{\mathrm{nfl,t}} \times \frac{\mathrm{nfl}_{\mathrm{t-1}}}{\mathrm{nav}_{\mathrm{t-1}}} - \\ - \mathrm{RRC}_{\mathrm{adm,t}} - \mathrm{RRC}_{\mathrm{tax,t}} - \mathrm{AE}_{\mathrm{t}} \tag{3.11}$$

$\mathrm{RRC}_{\mathrm{nav,t}} = (\mathrm{RNAV}_{\mathrm{t}} - r_{E,t}) =$ residual return contribution from net assets in period t

$\mathrm{RR}_{\mathrm{noa,t}} = (\mathrm{RNOA}_{\mathrm{t}} - r_{u,t}) =$ residual return on net operating assets in period t

$\mathrm{RR}_{\mathrm{nfl,t}} = (\mathrm{RNFL}_{\mathrm{t}} - r_{ND,t}) =$ residual return on net financial liabilities in period t

$$\mathrm{AE}_t = (r_{u,t} - r_{ND,t}) \times \left(\frac{\mathrm{ND}_{\mathrm{t-1}}}{\mathrm{E}_{\mathrm{t-1}}} - \frac{\mathrm{nfl}_{\mathrm{t-1}}}{\mathrm{nav}_{\mathrm{t-1}}}\right) = \text{aggregation error in period t} \tag{3.12}$$

The residual return on equity in period t	=	The residual return on net operating assets in period t
	×	One plus the net debt-equity ratio at book values
	+	The residual return on net financial liabilities in period t
	×	The net debt-equity ratio at book values
	-	The residual return contribution from administrative expenses in period t
	-	The residual return contribution from taxes in period t
	-	The aggregation error

The final adjustment to the representation of the earnings generation process is a decomposition of the return on net operating assets. In figure 3.1, the balance sheet and income statement were structured according to the two sub-portfolios of quoted and unquoted securities respectively. The return on net operating assets can be decomposed into the weighted average of the return on the two sub-portfolios. This is done in 3.13. The required rate of return on net operating assets is likewise decomposed into a required rate of return on the quoted and the unquoted sub-portfolios in 3.16.

$$RNOA_t = RNQS_t \times \frac{nqs_{t-1}}{nav_{t-1}} + RNUS_t \times \frac{nus_{t-1}}{nav_{t-1}} \tag{3.13}$$

The return on net operating assets in period t	=	The return on the portfolio of quoted securities in period t weighted by the portfolio's proportion of total net operating assets in period t-1
	+	The return on the portfolio of unquoted securities in period t weighted by the portfolio's proportion of total net operating assets in period t-1

$$RNQS_t = \frac{\text{Operating earnings on quoted securities excl administrative expenses}_t}{nqs_{t-1}}$$

$$= \text{Return on quoted securities in period t} \tag{3.14}$$

$$RNUS_t = \frac{\text{Operating earnings on unquoted securities excl administrative expenses}_t}{nus_{t-1}}$$

$$= \text{Return on unquoted securities in period t} \tag{3.15}$$

$$r_{u,t} = r_{nqs,t} \times \frac{MV(nqs)_{t-1}}{MV(nop)_{t-1}} + r_{nus,t} \times \frac{MV(nus)_{t-1}}{MV(nop)_{t-1}} \tag{3.16}$$

The required rate of return on the unlevered company in period t	=	The required rate of return on the portfolio of quoted securities in period t weighted by the portfolio's proportion of total net operating assets in period t-1
	+	The required rate of return on the portfolio of unquoted securities in period t weighted by the portfolio's proportion of total net operating assets in period t-1

$r_{nqs,t}$ = required rate of return on quoted secruities in period t

$r_{nus,t}$ = required rate of return on unquoted secruities in period t

Eventually, the expression for residual return on net asset value as a function of the residual returns on the two levered sub-portfolios of assets, the residual return from net financial liabilities, administrative expenses and taxes is obtained. Equation 3.18 shows the short expression for residual return on net asset value. This equation shows explicitly the five contributions to the total residual return.

$$\begin{aligned}\mathrm{RRC}_{\mathrm{nav,t}} &= \left(\mathrm{RR}_{\mathrm{nqs,t}} \times \frac{\mathrm{nqs}_{\mathrm{t-1}}}{\mathrm{noa}_{\mathrm{t-1}}} + \mathrm{RR}_{\mathrm{nus,t}} \times \frac{\mathrm{nus}_{\mathrm{t-1}}}{\mathrm{noa}_{\mathrm{t-1}}}\right) \times \left(1 + \frac{\mathrm{nfl}_{\mathrm{t-1}}}{\mathrm{nav}_{\mathrm{t-1}}}\right) - \\ &\quad - \mathrm{RR}_{\mathrm{nfl,t}} \times \frac{\mathrm{nfl}_{\mathrm{t-1}}}{\mathrm{nav}_{\mathrm{t-1}}} - \mathrm{RRC}_{\mathrm{adm,t}} - \mathrm{RRC}_{\mathrm{tax,t}} - \mathrm{EAE}_{\mathrm{t}}\end{aligned} \tag{3.17}$$

and furthermore,

$$\mathrm{RRC}_{\mathrm{nav,t}} = \mathrm{RRC}_{\mathrm{nqs,t}} + \mathrm{RRC}_{\mathrm{nus,t}} - \mathrm{RRC}_{\mathrm{nfl,t}} - \mathrm{RRC}_{\mathrm{adm,t}} - \mathrm{RRC}_{\mathrm{tax,t}} - \mathrm{EAE}_{\mathrm{t}} \tag{3.18}$$

The residual return on equity in period t	=	The residual return contribution from net quoted securities in period t
	+	The residual return contribution from net unquoted securities in period t
	+	The residual return contribution from net financial liabilities in period t
	+	The residual return contribution from administrative in period t
	+	The residual return contribution from taxes in period t
	+	The extended valuation error in period t

$\mathrm{RR}_{\mathrm{nqs,t}} = (\mathrm{RNQS_t} - r_{nqs,t}) =$ residual return on quoted secruities in period t

$\mathrm{RR}_{\mathrm{nus,t}} = (\mathrm{RNUS_t} - r_{nus,t}) =$ residual return on unquoted secruities in period t

$$\mathrm{RRC}_{\mathrm{nqs,t}} = (\mathrm{RNQS_t} - r_{nqs,t}) \times \frac{\mathrm{nqs}_{\mathrm{t-1}}}{\mathrm{noa}_{\mathrm{t-1}}} \times \left(1 + \frac{\mathrm{nfl}_{\mathrm{t-1}}}{\mathrm{nav}_{\mathrm{t-1}}}\right) = \tag{3.19}$$

= residual return contribution from net quoted securities

$$\mathrm{RRC}_{\mathrm{nus,t}} = (\mathrm{RNUS_t} - r_{nus,t}) \times \frac{\mathrm{nus}_{\mathrm{t-1}}}{\mathrm{noa}_{\mathrm{t-1}}} \times \left(1 + \frac{\mathrm{nfl}_{\mathrm{t-1}}}{\mathrm{nav}_{\mathrm{t-1}}}\right) = \tag{3.20}$$

= residual return contribution from net unquoted securities

$$\mathrm{RRC}_{\mathrm{nfl,t}} = (\mathrm{RNFL_t} - r_{nfl,t}) \times \frac{\mathrm{nfl}_{\mathrm{t-1}}}{\mathrm{nav}_{\mathrm{t-1}}} = \tag{3.21}$$

= residual return contribution from net financial liabilities

$$\begin{aligned}\mathrm{EAE_t} &= \left(r_{nqs,t} - r_{nus,t}\right) \times \left(\frac{\mathrm{MV(nqs)_{t-1}}}{\mathrm{MV(noa)_{t-1}}} - \frac{\mathrm{nqs_{t-1}}}{\mathrm{noa_{t-1}}}\right) \times \left(1 + \frac{\mathrm{nfl_{t-1}}}{\mathrm{nav_{t-1}}}\right) \\ &+ \left(r_{u,t} - r_{ND,t}\right) \times \left(\frac{\mathrm{ND_{t-1}}}{\mathrm{E_{t-1}}} - \frac{\mathrm{nfl_{t-1}}}{\mathrm{nav_{t-1}}}\right) \\ &= \text{extended aggregation error}\end{aligned} \tag{3.22}$$

By inserting equation 3.18 into equation 3.4, a theoretical model for determining the premium is obtained. The model has two parts. The first is an explicit forecasting period where the residual return for each period is inserted. The second part is the expected premium at the valuation horizon. Additionally, the model explicitly incorporates the contributions from five related but different parts of the return process. The model also expresses the relationship between residual returns and growth. The model is presented in equation 3.23[73].

$$\begin{aligned}\mathrm{Premium_0} &= \sum_{t=1}^{H}\left[\left(\prod_{\tau=1}^{t}\left(1+r_{E,\tau}\right)\right)^{-1} \times \begin{pmatrix}\mathrm{R\tilde{R}C_{nqs,t}} + \mathrm{R\tilde{R}C_{nus,t}} + \mathrm{R\tilde{R}C_{adm,t}} + \\ + \mathrm{R\tilde{R}C_{nfl,t}} + \mathrm{R\tilde{R}C_{tax,t}} + \mathrm{EAE_t}\end{pmatrix} \times \mathrm{\tilde{G}_{t-1}}\right] + \\ &+ \mathrm{Pr\tilde{e}mium_H} \times \mathrm{\tilde{G}_H} \times \left(\prod_{\tau=1}^{H}\left(1+r_{E,\tau}\right)\right)^{-1}\end{aligned} \tag{3.23}$$

The premium at the valuation date	=	The present value of the expected abnormal return contributions from quoted securities, unquoted securities, liabilities, administrative expenses, taxes and an aggregation error from period 1 to the valuation horizon
	+	The present value of the premium at the valuation horizon

Some comments with regard to the components of the model are required. First, it can be seen that in the case of an unlevered investment company only investing in quoted securities, it is appropriate to evaluate the performance of the company by simply comparing the return on the portfolio with the required rate of return on the asset portfolio. If the portfolio is well-

[73] The expectations operator has been dropped from now on.

diversified a wide market index could be an appropriate benchmark. In all other cases adjustments are necessary.

Second, in addition to raw performance, any expenses incurred have to be covered. Ongoing administrative expenses and taxes are the most obvious ones.

Third, the decomposition of the securities portfolio has to be made with caution. The aggregation of the sub-portfolios will cause another source of measurement error unless the sub-portfolios have the same risk. This error occurs when a value discrepancy exists between net asset value and market value of the investment company. The impact on premiums due to each component is further discussed below. This is the first part of the extended aggregation error (EAE).

Fourth, if the company uses debt financing an additional risk component comes into play. Consider the case when a positive/negative premium is originally caused by a positive/negative residual return. This results in a market value based debt-to-equity ratio that differs from the net asset value based debt-to-equity. This discrepancy between the net asset value and market value based measure of leverage is the second part of the extended aggregation error (EAE). When leverage is high the effect could be substantial. Note that the third and fourth issues are due to the use of net asset value bases for the performance evaluation.

3.2 Towards a statistical model – amendments due to heterogeneous beliefs and agency costs

The discussions in sections 1.1.2, 2.3 and 2.4 above indicate that the traditional approach to valuation needs to be amended. In sections 1.1.2 and 2.3, the issue of heterogeneous beliefs and the impact of diversification on premiums are discussed. It is shown that investors with heterogeneous beliefs will pay a lower price for a portfolio of securities than for the sum of the individual securities in the portfolio. Effectively, diversification ought to have a negative impact on premiums due to heterogeneous beliefs.

In sections 1.1.2 and 2.4, the issues of ownership structure and agency relations are discussed. The separation between effective control over the portfolio decisions and the economic consequences of these decisions may result in actions by the management team/majority shareholders that are not beneficial for all shareholders. The minority shareholders receive lower cash flows due to the agency relation and/or a perceived risk of compromising behavior by the majority shareholders. These issues could be summarized in terms of formal and controlling power. The ownership of a large proportion of shares or the existence of a strong and independent management team increases the probability of compromising behavior towards the non-controlling shareholders. Evidence of implemented actions interpreted as non-value maximizing behavior by the minority shareholders translates a limited probability of such behavior into almost certainty with respect to expected future behavior.

The need for amendments rather than refinements is valid for at least two reasons. First, we can not conclude ex ante that these issues have immediate cash flow effects. Excess administrative expenses due to agency relations and returns relative to a benchmark are measurable. The individual beliefs regarding each investment and the ability and incentives of the management team are not readily measurable. Moreover, it is not certain that they will ever materialize as cash flows and returns.

Second, risk in a traditional setting is measured by the expected volatility of asset returns[74]. Moreover the contribution by the individual asset to the variance of the market portfolio (measured as the covariance of returns between the two) constitutes the market priced risk. The risk in a behavioral and or agency setting is not necessarily related to expected volatility of returns. If behavioral and/or agency risks are of another form, they may not captured by the traditional risk measures. The risk perceived by the investors from a behavioral or agency perspective is harder to define than the traditional measures. Extrapolation from past return based information is generally not possible.

The amendments to the model would result in a general statistical model that is based on three sets of variables. First, there are the residual return contributions. The five components are included in the model for as many

[74] This is not to say the structure of the required rate of return shown here is restricted to risk as expected volatility of returns.

years as necessary. Second, there are the amendments for portfolio concentration (heterogeneous beliefs) and controlling power. Two assumptions regarding the portfolio concentration and power are made.

A 6: No additional information is obtained from using past or expected future levels of the measures for portfolio concentration and power.

A 7: The measures for portfolio concentration and power are assumed to have a linear relationship with premiums.

Third, a premium at the valuation horizon ought to be somehow included in order to capture long term prospects. In this sense, long term may be anything from after the first year to an undefined number of years ahead. The general structure for the statistical model is displayed in equation 3.24[75].

$$\mathrm{Premium}_0 = \alpha + \sum_{t=1}^{H} \begin{bmatrix} \beta_{nus,t} \times \mathrm{RRC}_{\mathrm{nus,t}} + \beta_{nqs,t} \times \mathrm{RRC}_{\mathrm{nqs,t}} + \beta_{adm,t} \times \mathrm{RRC}_{\mathrm{adm,t}} \\ + \beta_{nfl,t} \times \mathrm{RRC}_{\mathrm{nfl,t}} + \beta_{tax,t} \times \mathrm{RRC}_{\mathrm{tax,t}} \end{bmatrix}$$
$$+ \beta_{PCON} \times \mathrm{PCON}_0 + \beta_M \times \mathrm{M}_0 + \beta_{IP} \times \mathrm{Premium}_H + \varepsilon \tag{3.24}$$

$\beta_{.,t}$ = Regression coefficient on an independent variable for a measure for time t

PCON_0 = Portfolio concentration as a measure of heterogeneous beliefs at the valuation date

M_0 = A measure of exercised power due to agency situation in the closed-end investment company at the valuation date

3.3 The statistical model – an interpretation map

The theoretical model described in section 3.1 and amended in section 3.2 has provided a general structure for statistical testing. This general statistical model in equation 3.24 could be tested as it stands. In order to interpret the results from a statistical model, an interpretation map is required. The statistical regression coefficients can be interpreted based on the theoretical model. The interpretations are possible given certain regularity conditions regarding the time series behavior of the independent variables[76]. One set of

[75] The intercept would capture the present value of the extended aggregation error from the valuation date to the horizon date.

[76] The regularity conditions are not necessary but then the expected coefficient is simply the discount factor adjusted for accumulated growth.

regularity conditions is discussed below. Additionally, it is important to emphasize that unbiased measures of the independent variables are necessary to make any interpretation.

The statistical model in 3.24 rapidly becomes too extensive with respect to the number of independent variables. Five new independent variables are created for each additional year included in the model. Two things can be done to handle this. The first is to see if any of the residual return components or other variables may be excluded from the statistical model on theoretical and/or empirical bases. The exclusions are discussed in section 3.3.1. The second is to consider the time series behavior of the variables. The regularity conditions mentioned above reduce the need for extensive sets of measures over time for the independent variables. The characteristics of the regularity conditions are discussed in section 3.3.2. The implications for the expected parameter levels, the interpretation map, are discussed in section 3.3.3.

3.3.1 Exclusion of theoretically derived independent variables

There are two candidates for exclusions from the statistical model relative to the theoretical approach. They are the premium at the horizon and the residual return contributions from net financial liabilities. The arguments for excluding each of the variables are very different. The premium at the horizon is excluded due to difficulties to estimate it empirically. The residual return contributions from net financial liabilities are excluded due to negligible direct impact on premiums from leverage.

3.3.1.1 The premium at the horizon

The intercept of the statistical model is solely determined by the present value of expected extended aggregation errors. An unlevered closed-end investment company has no such intercept. If the company has a net debt-to-equity ratio in market value terms of 1, the intercept may be as substantial as -0.1[77].

[77] The following calculation is being made

The present value of the extended aggregation error as calculated above is a part of the premium at the horizon. The present value of the error subsequent to the horizon ought to be included in the premium at the horizon. This illustrates a separation problem that occurs when estimating the intercept and the premium at the horizon. Determining the exact proportion of what is included in the intercept due to the aggregation error is almost an impossible task.

Moreover, the entire model is aimed at explaining the premium at a specific point in time. The theoretical model suggests that the current premium is partly explained by the expected future premium. This provides little insight into what really explains premiums. With no insights into the determination of the premium at the horizon, it is of no use trying to include a highly erroneous estimate into the model. Statistically, an estimate of the premium at the horizon may be obtained in the intercept. Subsequently, it is possible to argue that the part of the premium measured by the intercept is partly due to the extended aggregation error and partly due to measures that have not been included in the model.

The major problem with including the premium at the horizon in the intercept is that there is an implicit assumption that this premium is equal across closed-end investment companies and over time. All time and company specific explanations must be included in the statistical model. If this is not the case the explanatory power will be substantially reduced. This research on the premium of closed-end investment companies acknowledges this issue but currently disregards it and excludes the premiums at the horizon from the statistical model[78].

$$\left[\left(r_{nqs,H+1} - r_{nus,H+1}\right)\times\left(\frac{\mathrm{MV}(\mathrm{nqs})_H}{\mathrm{MV}(\mathrm{noa})_H} - \frac{\mathrm{nqs}_H}{\mathrm{noa}_H}\right)\times\left(1+\frac{\mathrm{nfl_H}}{\mathrm{nav_H}}\right) + \left(r_{u,H+1} - r_{ND,H+1}\right)\times\left(\frac{\mathrm{ND}_H}{\mathrm{E}_H} - \frac{\mathrm{nfl}_H}{\mathrm{nav}_H}\right)\right] \Big/ \left(r_{E,H+1} - g\right)$$

assuming that $r_{nqs,H+1} = r_{nus,H+1} = r_{u,H+1} = 9\,\%$, $r_{ND,H+1} = 6\,\%$ $\frac{ND_H}{E_H} = 1$, $\frac{\mathrm{nfl}_H}{\mathrm{nav}_H} = 0.8$, $r_{E,H+1} = 6\,\%$ and $g = 6\,\%$. The value becomes -0.0938.

[78] Regressions are run using fixed effect models. The fixed effects absorb systematic differences between companies such as these.

3.3.1.2 The residual return contribution from net financial liabilities

Premium effects of financial liabilities are due to differences between the value of the liabilities for the net asset value calculation and market value of these liabilities. This situation occurs if the actual borrowing rate differs from the required rate of return, which occurs if the company borrows at fixed rates or has subsidized loans. Subsidized loans are in most cases government granted loans. Closed-end investment companies are generally not offered such loans. The case of fixed interest rates is more likely to be present. However, in order to obtain premium effects changing interest rates are required. Interest rates declined dramatically in the 1990s, which could cause premium effects during this period. Despite this, the leverage is very low in these companies, which effectively reduces the premium effect[79].

Theoretically, the most strongly argued economic effect is the tax shield obtained from leverage. The tax shield effect is questionable in the case of closed-end investment companies due to their tax exempt status, which is thoroughly discussed in chapter five. If any tax effects emerge, they should be handled through the tax variables in the current model.

Despite the limited or otherwise handled effects from leverage described above another effect remains. This one is based on the leverage on the operational activities. If any premium is generated on the operational activities the magnitude of that premium is proportionally increased by the financial liabilities. The definitions of the residual return contributions in equations 3.19 through 3.21 are all net asset value based. The contribution to value creation in the numerator is taken from the individual components and the denominator is consistently net asset value. This means that the residual returns generated from the operation are geared by the financial liabilities already in the respective residual return contribution.

Effectively, the residual return contribution from net financial liabilities exclusively handles the excess value due to the financial terms. This effect has been argued to be negligible. Consequently, it is assumed that the market

[79] This can be seen from the descriptive statistics in chapter six, sections 6.2.

value of financial liabilities is equal to the value of financial liabilities in the net asset value calculations.

A 8: Net financial liabilities (nfl) are measured at market value in the balance sheet and thereby equal net debt (ND) in the required rate of return equation, i.e. $nfl_t = MV(nfl_t) = ND_t$.

As a result of assumption eight, the residual return contributions from net financial liabilities are removed from the statistical model[80].

3.3.2 Characteristics of the regularity conditions on the residual return process

There are many ways to add structure to the process of residual returns. Two stabilizing components are discussed here. These are the assumptions about the level of risk over time and the serial correlation for the residual return components over time. The residual return contributions are assumed to follow the general pattern presented in figure 3.2.

Consequently, the number of necessary residual return components to analyze is reduced from an infinite number to a small number of specifically estimated residual return components plus one which determines the starting point for the sequence from T+1 to H in the figure above. Finally, the theoretically derived coefficient levels for each residual return component serve as the interpretation map.

Three assumptions are added in order to obtain a stable structure for the residual return contributions. The first two assumptions, A:9 and A:10, deal with the time series behavior of risk in the asset portfolio, debt, the leverage and consequently the determination of the required rate of return on net asset value.

A 9: The required rates of return on the unlevered assets and debt are constant over time.

A.10: The market-based net debt-to-equity ratio, $\frac{ND}{E}$, is constant over time.

[80] Descriptive statistics and correlations are provided in chapter six.

Assumptions A:9 and A:10 ensure that the required rate of return on equity remains constant over time for each company by limiting the financial structure and unlevered asset portfolio risk level. The immediate effect for the regression model is that the variations in the residual return contributions are only driven by changes in the companies' unlevered profitability. In expectation, the risk level of the company is expected to be unchanged over time from the current valuation date onwards[81].

The second sequence in figure 3.2 ranging from period T+1 to H is characterized by convergence in growth and residual return contributions. The convergence starts with the level of growth and residual return at time T+1 and goes towards a long-term sustainable level after period H. The length of the convergence sequence is H-T periods. The strength of the convergence can be characterized by various functional forms. The effect on premiums has to handle two separate components apart from discounting. These are the convergence in the individual residual return contribution and the growth in net asset value from period T to each subsequent period.

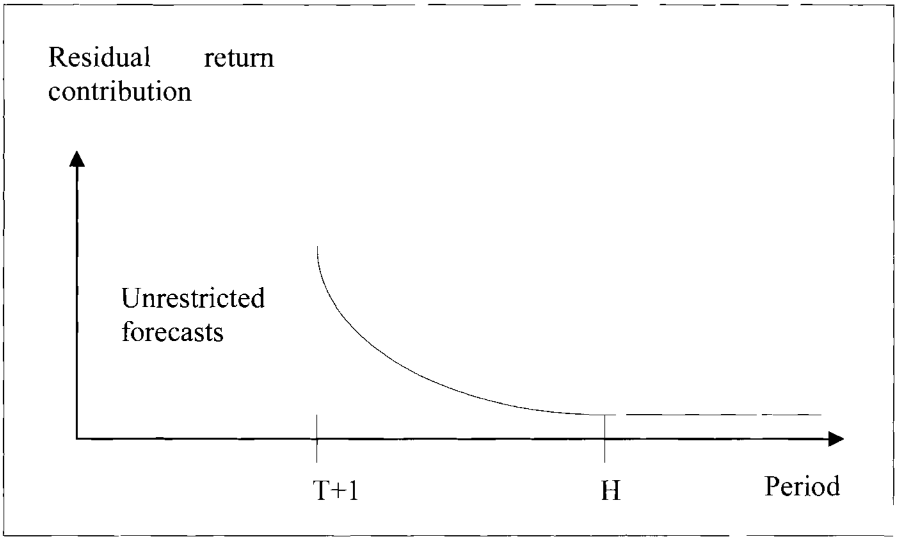

Figure 3.2: Graphical representation of the residual return contribution pattern using a finite geometric series from T+1 to H and thereafter a constant residual return contribution.

[81] This is not the same as stating that the risk level may not change from one valuation date to another when new information has been provided to the market.

A simple way to handle both components is to use a multiplicative component that captures the two components simultaneously. The component is called a convergence factor. The structure of the convergence factor makes it impossible to separate the growth pattern from the pattern of the residual return contributions. This further means that the convergence measure may take a value higher than one. The yearly growth is expected to be at least a few percentage points. The growth forces the convergence factor to be above one. The part of the component regarding the residual return contribution is likely to be below one. A level below one can be interpreted as a mean reversion behavior in the residual return contribution. The combination of the two effects may then be either above or below one. The structure of the time series behavior is expressed in equation 3.25.

$$\mathrm{RRC}_{\bullet,T+h} \times \mathrm{G}_{T+h-1} = \lambda_{\bullet}^{h-1} \times \mathrm{RRC}_{\bullet,T+1} \times \mathrm{G}_{T} \qquad (3.25)$$

$\lambda_{\bullet}$ = the combined convergence measure for the residual return contribution and growth for a residual return contribution

It is important to emphasize that the λ is specific for each residual return contribution. One of the benefits from combining the two effects into one component is that growth seems to adjust in relation to profitability. This is so since the dividend policy appears to be stable over time (e.g. Lintner, 1956, and Bertmar et al., 1977). Even though the relationship between growth and residual returns is less pervasive, it is likely to exist. The relationship between growth and profitability allows for gradually growing or at least stable dividends, which has been documented in previous research[82]. This modeling is compatible with the possibility to retain capital gains within the company as is the case for British and Swedish closed-end investment companies.

In order to achieve convergence with respect to undiscounted residual return contributions, λ must be lower than the growth rate in period T+1. A constant growth rate combined with mean reversion drives a λ that is lower than the growth rate. Strongly negatively correlated residual return contributions over time have a similar effect with a change of signs. A constant growth with expected perfectly negative correlation drives a value of λ equal to the negative of the growth rate. Any convergence towards a long term stable level requires a λ that is somewhat less negative than minus

[82] See for example Lintner (1956).

the growth rate[83]. The characteristics of the second period are summarized in assumption eleven.

A 11: Each residual return contribution component has a persistence path which can be characterized with two factors, H-T, showing the number of periods of the convergence sequence and $\lambda_{RRCcomponent}$, showing the strength of the combined convergence of the residual return contributions and growth[84].

$$H>T \text{ and } -\frac{G_{T+1}}{G_T} < \lambda_{RRCcomponent} < \frac{G_{T+1}}{G_T}.$$

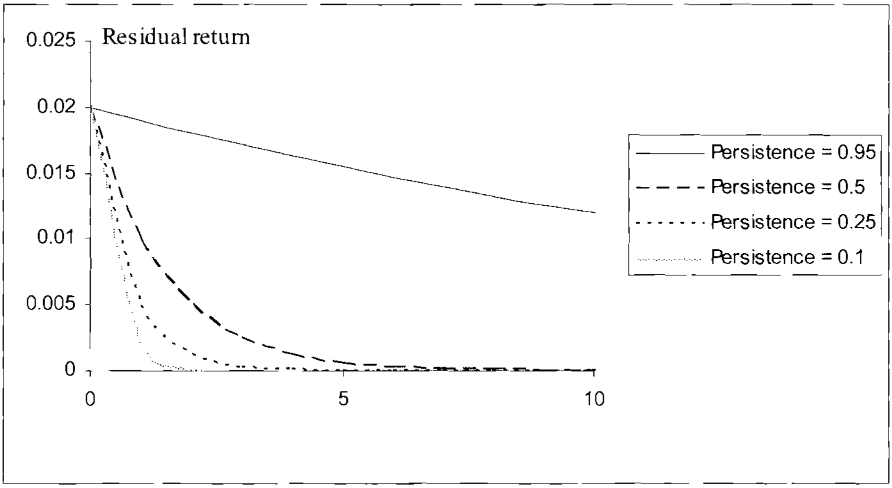

Figure 3.3: Residual return contribution pattern with different convergence factors. Negative serial correlation is excluded from the graph.

[83]Admittedly, negative serial correlation is improbable. For the sake of completeness and in order to analyze the entire effects of different time series characteristics the negative correlations are kept for the assumption and numerical examples.

[84] The boundaries for the λ factor can be derived from 3.25. Recognize that $\frac{RRC_{T+2}}{RRC_{T+1}} = \lambda \Big/ \frac{G_{T+1}}{G_T}$ has to hold. The ratio is the persistence in residual returns.

In order to obtain convergence in residual return contribution, the left hand side of the equation has to be less than one, which implies that $\lambda < \frac{G_{T+1}}{G_T}$.

First, as stated above, it must be noted that the convergence pattern may be negative. This means that a high degree of volatility in residual returns may be expected but the absolute level converges towards zero. The effects on residual return contributions for various levels of persistence are presented in figure 3.3. Note that the persistence is not identical to λ, since λ also includes the growth in the underlying capital base.

The statistical effect of assumption eight is that the number of independent regression variables can be reduced substantially. The sequence from T+1 to H can be characterized by the individual residual return contributions in period T+1 multiplied by a convergence factor. The convergence factor takes the form of the sum of a finite geometric series. The structure of the convergence factor is presented in 3.26[85].

$$\mathrm{CF}_{\mathrm{RRC}_{\mathrm{component}}} = \frac{1}{1+r_E}\sum_{\tau=\mathrm{T}+1}^{\mathrm{H}}\left(\frac{\lambda}{1+r_E}\right)^{\tau-\mathrm{T}-1} = \left[\frac{1-\left(\frac{\lambda_{\mathrm{RRC}_{\mathrm{component}}}}{1+r_E}\right)^{\mathrm{H-T}}}{1+r_E-\lambda_{\mathrm{RRC}_{\mathrm{component}}}}\right] \tag{3.26}$$

$$\mathrm{Premium}_{\mathrm{T+1\to H,T}} = E_0\left[\begin{array}{l} CF_{RRC_{nqs}}\times \mathrm{R\tilde{R}C}_{\mathrm{nqs,T+1}} + CF_{RRC_{nus}}\times \mathrm{R\tilde{R}C}_{\mathrm{nus,T+1}} \\ - CF_{RRC_{adm}}\times \mathrm{R\tilde{R}C}_{\mathrm{adm,T+1}} - CF_{RRC_{tax}}\times \mathrm{R\tilde{R}C}_{\mathrm{tax,T+1}} + \\ \beta_{PCON,T}\times \mathrm{PCON}_{\mathrm{H}} + \beta_{M,T}\times \mathrm{M}_{\mathrm{H}} \end{array}\right] \tag{3.27}$$

and

$$\mathrm{Premium}_{\mathrm{T+1\to H,0}} = \mathrm{Premium}_{\mathrm{T+1\to H,T}}\times \mathrm{G}_T/(1+r_E)^T \tag{3.28}$$

$\mathrm{CF}_{\mathrm{RRCcomponent}}$ = convergence factor for a specified RRC component

[85] A similar factor, the GPF, has been used by Runsten (1998). The CF differs from the GPF in two wars. First, the convergence factor, λ, describes the combined convergence in the residual return components and growth. Second, the discounting of the first component, i.e. $1/(1+r_E)$, has been multiplied with the GPF. The result is that an undiscounted residual return contribution component has been left as the independent variable.

$\text{Premium}_{T+1 \rightarrow H,T}$ = the intrinsic premium related to information for period T+1 to period H valued at time T

Premium at time T for the sequence T+1 to H	=	the expected residual returns in period t+1, decomposed into the residual return contributions on the portfolios of quoted and unquoted securities, administrative expenses and taxes respectively
	×	residual return component specific convergence factors

and

Premium related to the sequence from T+1 to H at time 0	=	Present value of the premium related to the sequence from T+1 to H at time t

There are four residual return contributions for each time period after the removal of the net financial liabilities[86]. Effectively the number of independent variables may be reduced with up to four times H-T-1. This means that even if there is only two periods between H and T+1, there are eight independent variables less.

A more parsimonious regression model has now been derived. In section 3.3.1.1, the removal of an explicit forecast of $\text{Premium}_{H \rightarrow \infty}$ was discussed. The premium at the horizon should be captured in the intercept. In section 3.3.1.2, the net financial liabilities were removed from the model. Finally, the number of independent variables has been reduced due to assumptions on the time series behavior of residual return contributions and growth. The structure of the most detailed regression model is obtained can consequently be determined as in 3.29.

[86] The residual return contributions concern net quoted securities, net unquoted securities, administrative expenses and taxes.

$$\begin{aligned}\text{Premium}_0 = \alpha + \sum_{t=1}^{T} \begin{bmatrix} \beta_{nus,t} \times \text{RRC}_{\text{nus,t}} + \beta_{nqs,t} \times \text{RRC}_{\text{nqs,t}} \\ + \beta_{adm,t} \times \text{RRC}_{\text{adm,t}} + \beta_{tax,t} \times \text{RRC}_{\text{tax,t}} \end{bmatrix} \\ + \beta_{nus,T+1} \times \text{RRC}_{\text{nus,T+1}} + \beta_{nqs,T+1} \times \text{RRC}_{\text{nqs,T+1}} \\ + \beta_{adm,T+1} \times \text{RRC}_{\text{adm,T+1}} + \beta_{tax,T+1} \times \text{RRC}_{\text{tax,T+1}} \\ + \beta_{PCON} \times \text{PCON}_0 + \beta_M \times \text{M}_0 \end{aligned} \tag{3.29}$$

The final design of the model must be further elaborated, since measurement of the independent variables as well as potential partitioning of the sample has to be defined. Moreover, the number of periods, T, to be entered specifically using detailed forecasts remains an empirical issue. If all independent variables specified in equation 3.29 would be statistically significant, the number of parameters to estimate would be at least seven, which is the case when T is equal to 0.

3.4 Coefficient levels

This section briefly describes the theoretical coefficients for the regression model under ideal circumstances for linear regression techniques. It is believed that the theoretical coefficients provide reference points and a map onto which the empirical findings can be evaluated. The derived coefficients are applicable for all residual return components in the regression model in 3.29. The sign of the coefficient is of course dependent on the characteristics of each component. One special issue arises if the conservative/aggressive valuation procedures have been used to determine net asset value and when investments are not continuous. This case is discussed in section 3.4.2.

3.4.1 Expected regression coefficient levels based on the convergence factor, λ

Tables 3.1a and b show the expected regression coefficients under the assumptions that there are no detailed estimates for years prior to the convergence period, i.e. that T=0, and that the required rate of return on equity is 10 %., in equation 3.26. Table 3.1a shows the expected coefficients if the convergence period is relatively short and table 3.1b shows expected coefficients if the convergence period is long. In table 3.1b the coefficients converge towards level with an infinite horizon, i.e. the Gordon growth model[87].

λ/H	1	2	3	4	5	6	7	8	9	10
-0.95	0.91	0.12	0.80	0.22	0.72	0.29	0.66	0.34	0.62	0.38
-0.75	0.91	0.29	0.71	0.42	0.62	0.49	0.58	0.52	0.56	0.53
-0.55	0.91	0.45	0.68	0.57	0.63	0.60	0.61	0.60	0.61	0.61
-0.35	0.91	0.62	0.71	0.68	0.69	0.69	0.69	0.69	0.69	0.69
-0.15	0.91	0.79	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
0	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
0.15	0.91	1.03	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
0.35	0.91	1.20	1.29	1.32	1.33	1.33	1.33	1.33	1.33	1.33
0.55	0.91	1.36	1.59	1.70	1.76	1.79	1.80	1.81	1.81	1.82
0.75	0.91	1.53	1.95	2.24	2.44	2.57	2.66	2.72	2.77	2.80
0.95	0.91	1.69	2.37	2.96	3.46	3.90	4.28	4.60	4.88	5.13
1.00	0.91	1.74	2.49	3.17	3.79	4.36	4.87	5.33	5.76	6.14
1.05	0.91	1.78	2.61	3.40	4.15	4.87	5.56	6.22	6.84	7.44

Table 3.1a: Expected convergence factors for different levels of lambda and the time when the valuation horizon is expected when T = 0 and r=0.1 using equation 3.26.

From the tables it can be seen that regression parameter may vary dramatically depending on the two parameters λ and H, but it remains positive. A range from about 0.1 to 20 can be observed where levels between 0.9 and 20 are relevant as long as λ is positive.

Moreover, it can be seen from the tables that the coefficients are low. Three benchmarks can be useful to keep in mind. The first one is the completely transitory residual return contribution which is the case of λ equal to 0. In this case the coefficient is simply the discount factor, which is equal to 0.91 in the tables. The second case is the constant residual return contribution with no growth. Then the coefficient is the inverse of the required rate of return, which is 10. This is identical to the situation when λ is 1 and H is very large. The third case is the constant residual return contribution with growth. Using a 5 % growth rate the coefficient converges to the inverse of the required rate of return minus the growth rate, which is 20. This is identical to λ being equal to 1.05 and H is very large.

[87] In this case the Gordon growth model is determined as $\frac{1}{r_E - \left(\lambda_{RRC_{component}} - 1\right)}$.

λ/H	10	20	30	40	50	60	70	80	90	100
-0.95	0.38	0.46	0.48	0.49	0.49	0.49	0.49	0.49	0.49	0.49
-0.75	0.53	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54
-0.55	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
-0.35	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
-0.15	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
0	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
0.15	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
0.35	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
0.55	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82
0.75	2.80	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86
0.95	5.13	6.31	6.58	6.65	6.66	6.67	6.67	6.67	6.67	6.67
1.00	6.14	8.51	9.43	9.78	9.91	9.97	9.99	10.00	10.00	10.00
1.05	7.44	12.10	15.00	16.90	18.00	18.80	19.20	19.50	19.70	19.80

Table 3.1b: Expected convergence factors for different levels of lambda factors and the time when the valuation horizon is expected when T = 0 and r=0.1 using equation 3.26.

3.4.2 Effects of conservative/aggressive valuation procedures

The discussion above has been conducted under the assumption of accurate market valuation of the portfolio securities. Market valuation of quoted securities is unproblematic, but when it comes to unquoted securities observable market values do not exist. The management of the investment company provides estimates of the value of unquoted securities. These estimates are the basis for the net asset value calculations. Two broad categories of valuation techniques seem to dominate, the historical cost adjusted for write-downs and some multiple on an accounting number. The historical cost technique may result in conservative or accurate valuation and the technique using multiples may result in conservative, accurate or aggressive valuation[88].

[88] Despite conservative accounting principles in general the valuation may be market based at certain points in time, e.g. directly after an investment.

When a closed-end investment company makes investments in unquoted securities and the carrying value is not marked-to-market, systematic impacts on premiums and residual returns are expected (Skogsvik, 1998). If the investment is a non-recurring activity the time series pattern of residual returns can be analyzed and the effects on expected regression coefficients identified. Equation 3.30 shows the relationship between residual returns, required rates of returns, premiums and growth.

$$\mathrm{RR}_{\mathrm{nus,t}} = \left(1 + r_{nus,t}\right) \times \mathrm{Premium}_{\mathrm{nus,t\text{-}1}} - \mathrm{Premium}_{\mathrm{nus,t}} \times \frac{\mathrm{G}_{\mathrm{nus,t}}}{\mathrm{G}_{\mathrm{nus,t\text{-}1}}} \quad (3.30)$$

$$\mathrm{Premium}_{\mathrm{nus,t}} = \frac{MV(\mathrm{nus}_{\mathrm{t}})}{\mathrm{nus}_{\mathrm{t}}} - 1$$

Figure 3.3 illustrates the residual return effects of an individual investment with conservative, aggressive and market based valuation techniques and when the clean-surplus relation holds. The underlying investment has a zero net present value and the ex ante expectation are materialized. In the case of conservative accounting, no revenue recognition after the investment date occurs until the realization date. The aggressive valuation case is assumed to generate a positive residual return of ten percentage points during the first four periods which results in a negative residual return in the final period. The marked-to-market investment shows no residual return in any period.

The graph shows that unless independent variables for all future periods of the investment are included in the model, the coefficients may absorb the expected future reversal in residual returns. It is reasonable to expect that the coefficient on unquoted securities is low or even negative. The impact depends on where in the investment cycle the observations are taken when conservative/aggressive valuation principles are used. The coefficient is expected to become more pronounced the closer the observations are to the realization date, i.e. more negative if the period 4 observation is used than if the period 2 observation is used as independent variables. In the setting of table 3.1, the case can be compared to a strongly negative sign for λ and H equal to 2. The closer the observation is to the realization period the more negative λ gets. Note that the λ will go below -1. One way to control for these effects is to include historic residual returns contributions in the regression model in addition to expected future residual returns contributions.

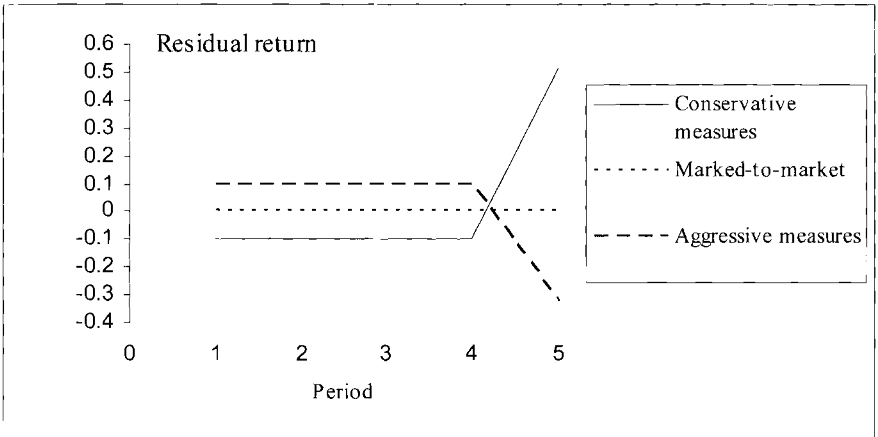

Figure 3.3: Residual return using market valuation vs conservative and aggressive valuation of net unquoted securities for a single investment. The investment is made at the end of period 0 and it is hold through period 5. The divestment takes place at the end of period 5. $r_E = 10\,\%$ and $G_{nus,t} / G_{nus,t-1} = 1.0$ for the initially negative residual returns and $G_{nus,t} / G_{nus,t-1} = 1.2$ for the initially positive residual return. Expected premium changes for each period

If the investment company is engaged in many unquoted investment projects at the same time, the conclusion might change under certain circumstances. This is dependent on growth and changes in measurement based premiums[89].

3.5 Summary of theoretical model and expectations for regression coefficients

In this chapter the theoretical model has been derived based on the residual income model. The theoretical model and the statistical amendments due to the diversification and agency predictions show that premiums are expected to depend on the following firm and market characteristics listed below. The

[89] See for example Skogsvik (1998) and Zhang (2000).

expected sign of the relationship with premiums is indicated within parentheses.

- Expected future residual return contributions from quoted and unquoted securities respectively (+),
- Expected future administrative expenses (-),
- Expected future taxes (-),
- Controlling power (-), and
- Portfolio concentration (+).

The operationalizations of the theoretical representations are discussed in the next chapter.

4 Empirical measurement and design

After having derived the theoretical framework and analyzed its properties in chapter three, the focus now turns towards the empirical tests. It is important to keep in mind that the proposed levels of the coefficient estimates from chapter three should be seen as indicative with respect to the relationship between the premium and its determinants. Those coefficient estimates are dependent on the assumptions made concerning the time series properties of the residual return contributions. However, the model in chapter three does not prescribe any particular relationship between the premium and its determinants with respect to its time series properties. This is an observation that allows for considerable freedom when the empirical tests are designed.

This and the following chapter present the regression models to be estimated and the partitions of the full sample. In this chapter the internal aspects of the premium tests is emphasized. These aspects concern the residual return measures and other variables which are included in the regressions and how they are empirically measured. The first part discusses in detail the regressions and the rationale for running various alternatives. Thereafter the measurement of the variables is discussed, the functional form included. Finally, the operationalization of the measures of diversification and controlling power variables, PCON and M, are presented. The following chapter discusses external factors such as tax system and capital markets in general.

4.1 Regression design

The theoretical model presented in chapter three is designed using data on a very detailed level, namely sub-portfolio specific return measures where administrative expenses and taxes have been extracted. However, empirical tests on that level of detail require substantial and precise data, which are not generally available in databases. Direct collection of raw accounting data is necessary. This can only be done for a limited sample, in this case the Swedish sample. In this sense, the British sample can be seen as a control sample towards which the Swedish results can be compared and analyzed. Second, as has been observed in chapter two, previous research has not investigated the impact on premiums of the (residual) return process in such detail. In order to be able to compare the results from the present study with results from previous research, regressions based on net asset value data are preferred. Consequently, empirical tests on such aggregated data are appropriate, also for the sake of comparability. Third, the three main issues discussed here are the additional explanatory power and coefficient estimates on detailed portfolio return data, diversification and ownership. Estimating the marginal contribution of each piece of data on the premium of closed-end investment companies requires a base model. The base model excludes these relevant pieces, but has the same fundamental structure as the more sophisticated model.

The most aggregate model tested here is when the only return measure is return on net asset value, but with administrative expenses and taxes incorporated as separate variables. These two components are separated because they have been the focus of much attention in previous research and they are independent of the other key elements of the extensive model. The number of periods to be included in the model remains an empirical issue based on statistical significance. This is also the case for how the expected future residual returns should be estimated as well as their functional form (see sections 4.2.6.1 and 4.2.6.2). The first regression model is[90]

$$\text{Premium}_0 = \alpha + \sum_{t=1}^{T+1} \left[\beta_{nav,t} \text{RRC}^{\text{eat}}_{\text{nav,t}} + \beta_{adm,t} \text{RRC}_{\text{adm,t}} + \beta_{tax,t} \text{RRC}_{\text{tax,t}} \right] + \tilde{\varepsilon} \tag{4.1}$$

$\text{RRC}^{\text{eat}}_{\text{nav,t}} =$ residual return contribution from net asset value excluding administrative expenses and taxes in period t

The measurement of the expectations is discussed below. The second model adds the separation of residual return contributions from quoted and unquoted securities as presented in equation 4.2.

$$\text{Premium}_0 = \alpha + \sum_{t=1}^{T+1} \begin{bmatrix} \beta_{nus,t} \text{RRC}_{\text{nus,t}} + \beta_{nqs,t} \text{RRC}_{\text{nqs,t}} + \\ + \beta_{adm,t} \text{RRC}_{\text{adm,t}} + \beta_{tax,t} \text{RRC}_{\text{tax,t}} \end{bmatrix} + \tilde{\varepsilon} \tag{4.2}$$

The third and fourth models introduce the variables for measuring diversification/concentration and controlling power, PCON and M. In order

[90] Note that the first period after the valuation horizon is moved into the summation.

to analyze the marginal contribution of these variables both the net asset value based model and the sub-portfolio based model is estimated. The two models are seen in 4.3 and 4.4.

$$\begin{aligned}\text{Premium}_0 &= \alpha + \sum_{t=1}^{T+1}\left[\beta_{nav,t}\text{RRC}^{\text{eat}}_{\text{nav,t}} + \beta_{adm,t}\text{RRC}_{\text{adm,t}} + \beta_{tax,t}\text{RRC}_{\text{tax,t}}\right] + \\ &+ \beta_{PCON} PCON_0 + \beta_M \text{M}_0 + \tilde{\varepsilon}\end{aligned} \tag{4.3}$$

$$\begin{aligned}\text{Premium}_0 &= \alpha + \sum_{t=1}^{T+1}\begin{bmatrix}\beta_{nus,t}\text{RRC}_{\text{nus,t}} + \beta_{nqs,t}\text{RRC}_{\text{nqs,t}} + \\ + \beta_{adm,t}\text{RRC}_{\text{adm,t}} + \beta_{tax,t}\text{RRC}_{\text{tax,t}}\end{bmatrix} + \\ &+ \beta_{PCON}\text{PCON}_0 + \beta_M \text{M}_0 + \tilde{\varepsilon}\end{aligned} \tag{4.4}$$

After having defined the fundamental models to be estimated, an examination of how the variables are measured with a special emphasis on PCON and M is required.

4.2 Measurement of premium and return variables

The residual return contributions consist of two parts, the total return on the asset base and the required rate of return on that asset base. Moreover, the valuation of the asset base at each date complicates the measurement of both the numerator and the denominator of the return measures and the premium itself. These three parts are of particular importance when conservative or other non-market measures are used.

4.2.1 The asset base

Two main sources for estimating the values of the asset bases are available. These are researcher estimated market values or the estimates used by the management of the company for assets and liabilities. The definition of net asset value states that the market values of assets minus the market values of liabilities should be used. None of the two sources are perfect measures of market values in all cases. Consequently, the potential alternatives and their merits and deficiencies have to be evaluated.

It could be argued that the management of the investment company most likely has the best information available regarding the portfolio investments. The quoted securities are always measured at current market value. In the case of unquoted securities valuation techniques are used generally benefiting from private information about the company. This is particularly so if the investment company follows a focused and active investment strategy. Even if the techniques employed are not as sophisticated as one might expect, the valuations are reasonably not worse than those of an external analyst/researcher. A final argument is that this is the information provided to the market by the company. Since the information provided by the company is important in the decision making by the investor, in-company valuation is important. This leads to the conclusion that if management presents an estimate of net asset value and its components, these estimates should be used.

If no such estimates are available, another alternative has to be used. Market values for quoted securities are always at hand, either from the company or from mapping the portfolio investments with current market prices by the researcher[91]. Regarding unquoted securities the book value of the investments in these securities is always available. Book value is generally the lower of the acquisition cost and current market value. This alternative assures that no overstatement of net asset value will occur, i.e. premiums will not be too low. On the other hand, no value creation will be measured before the realization date, meaning that the income values will be distorted relative to market values.

Second, if the investments are large enough to be directly included in a consolidated balance sheet, the consolidated values could be used as the measure for net asset value[92]. These values are subject to changes in or related to the investment object due to ongoing profitability, dividend distribution, goodwill amortization, depreciation of excess value of fixed assets and potential write-downs. Consequently, this value can be either higher or lower than the acquisition cost. The value creation to the investment company is more continuously measured due to these changes. Potentially, this could result in less measurement bias in net asset value than when historical acquisition cost is used.

[91] No case has been identified when a market value of the quoted securities has not been available.

[92] This is the case for a small number of Swedish observations.

Third, an external estimate of the market value of the unquoted investment could be made using either a complete valuation model or multiples from a relevant industry. A complete fundamental analysis to perform a valuation is not possible due to lack of information. Multiples could be used under the assumption that the portfolio company is sufficiently similar to the peer companies in its industry. However, many factors influence the valuation and there is a substantial risk for researcher induced errors.

The arguments above have lead to the following conclusions. First, when management estimates are available, they are used. Second, if no such estimates are available, the consolidated book value is used[93]. Third, if none of the first two alternatives are available, the book value of the investment in the accounting reports from the investment company is used.

4.2.2 The premium

The premium is the ratio between the difference between the market value of the investment company and the net asset value divided by the net asset value measured at the same point in time. All numbers used are total values, i.e. the stock market price of a share times the number of shares divided by total net asset value. The market value could reasonably be measured either at the end of the accounting year or two to three months subsequent to that day. The latter alternative would be used to assure that all information about prior year's performance is incorporated in prices due to the presentation of the annual report. In the case of closed-end investment companies, the value of the portfolio is directly related to the stock market. This means that during the months subsequent to the end of the accounting year both prices and the composition of the portfolio may have changed. This could have a non-negligible impact on the market value of the investment company shares.

In order to consider the end of the accounting year for measuring the numerator, it is necessary that the information about the portfolio value is effectively communicated to the market more or less instantaneously. Such information is partly regulated and has been so for many years and lately much of the relevant information is available on web pages etc. Moreover,

[93] This means that the consolidated accounting value of equity plus the unrealized gains on quoted securities is used as the measure of net asset value.

the trading done by investment companies can continuously be followed by other market participants, who consequently can map the portfolio composition.

The conclusion is that the market value at the end of the accounting year is used.

As has been discussed in the previous section, the measurement of particularly unquoted securities potentially has a large impact on the premium levels. Consolidated numbers and book values may induce an upward bias in premiums. Management estimates may be biased in any direction. Any bias is appropriately matched with a similar bias in residual returns, since the clean-surplus relation holds. Effectively, no systematic effect on the estimated parameters is expected. Any effect is due to how the estimates are made given the available information. This is mainly due to non-continuous investments in unquoted securities as discussed above and which is further elaborated on below in section 4.2.6.

4.2.3 The total return measures

In this category five levels of returns are present. These are return on net asset value, administrative expenses, taxes, return on net unquoted securities and return on net quoted securities.

First, the return on net asset value is the least complicated measure to operationalize. Independent of the measurement of the asset base, it is defined according to the clean-surplus relation[94]. This means that the change in net asset value between the start and the end of the period adjusted for the capital contributions and dividends is the numerator and the company's estimate of net asset value at the beginning of the period is the denominator[95,96]. As stated above the return measures used in the regressions are unaffected by administrative expenses and taxes. Consequently, these two items are added back.

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[94] The clean-surplus relation hold by construction since earnings during the period is the residual from the clean-surplus calculation.

[95] Conversion of debt to equity is included in capital contributions.

[96] Dividends in equation 4.5 are used as net dividends, i.e. dividends minus capital contributions.

$$\mathrm{RNAV}_t^{eat} = \frac{\mathrm{nav}_t + \mathrm{div}_t + \mathrm{adm}_t + \mathrm{tax}_t - \mathrm{nav}_{t-1}}{\mathrm{nav}_{t-1}} \tag{4.5}$$

RNAV_t^{eat} = Return on net asset value excluding administrative expenses and taxes in period t

Second, administrative expenses are a summary variable for potentially several line items in the income statement of the closed-end investment companies. Conventional items such as management fees, depreciations and expenses related to running the business are included. Moreover, legal and financial expenses, which are not interest expenses, are also included. An example of such expenses is expenses related to new capital contributions[97]. The residual return contribution from administrative expenses is obtained, $\mathrm{RRC}_{adm,t}$, by dividing the administrative expenses with beginning of period net asset value.

Third, tax expenses are the total tax expenses from the income statement. This measure includes deferred taxes[98]. The residual return contribution from taxes is obtained by dividing tax expenses with beginning of period net asset value.

Fourth, the return from net quoted and unquoted securities is more complicated. Fundamentally, the calculations could be done in the same manner as for the return on net asset. As an example, the return on net quoted securities can be calculated using equation 4.6 given that all data is available. The return on net unquoted securities can be calculated in the same way.

$$\mathrm{RNQS}_t = \frac{\mathrm{nqs}_t - \text{net investments}_{\mathrm{nqs},t} - \mathrm{nqs}_{t-1}}{\mathrm{nqs}_{t-1}} \tag{4.6}$$

The change in value of quoted and unquoted securities is readily available from databases and annual reports. The complicated matter is to identify net investments in the two portfolios respectively. As for British data, databases

[97] In the case of British data when information from Datastream is used, this is the sum of the variables 510 (management and general expenses), 126 (directors' remuneration) and 118 (auditors' remuneration).
[98] In the case of British data, this is variable 203 (total tax charge) in Datastream.

do not provide such information. Consequently, such analyses are impossible to perform. In the case of Swedish data substantially more information is at hand due to direct annual report data. Two alternatives are available depending on the information available. In investments and the proceeds from the sales from the asset portfolio is available, equation 4.7 can be used.

$$\text{net investments}_{nqs,t} = \text{investment}_{nqs,t} - \text{selling price}_{nqs,t} \tag{4.7}$$

The second alternative requires that the acquisition cost or the written down value of the asset portfolio is available. Then net investments can be calculated according to equation 4.8.

$$\text{net investments}_t = \text{nqs}_t^{acq} - \text{gains}_t + \text{losses}_t + \text{writedowns}_t - \text{nqs}_{t-1}^{acq} \tag{4.8}$$

nqs_t^{acq} = net quoted securities at acquisition cost at time t

gains_t = realized gains in period t

losses_t = realized losses in period t

writedowns_t = writedowns from acquisition cost in period t

The calculated net investments can subsequently be used in equation 4.6 to calculate the return measure. Information necessary for one of the two alternatives are available for the Swedish data for net quoted securities[99].

Finally, the return contributions from unquoted securities can be estimated by the known components of RNAV_t^{eat}, RNQS_t, and net financial expenses, which are not included in administrative expenses above, over net asset value as follows

$$\text{RNUS}_t = \left[\text{RNAV}_t^{eat} + \frac{\text{net financial expenses}_t}{\text{nav}_{t-1}} - \text{RNQS}_t \times \frac{\text{nqs}_{t-1}}{\text{nav}_{t-1}} \right] \times \frac{\text{nav}_{t-1}}{\text{nus}_{t-1}} \tag{4.9}$$

[99] Note that the calculation of return on net quoted securities in 4.7 assumes that all investments are made at the end of the period. In most cases the effect is small due to this limitation.

4.2.4 The required rate of return

The issue of measuring normal or expected return on any of the asset bases is theoretically complicated and empirically many alternatives are at hand. Most models include some risk free rate of return and a risk premium then added. The level of the company specific risk premium is where the models differ. Different sets of risk factors are used in order to map the risk drivers to a quantified risk premium. The most frequently discussed models are the CAPM (Capital Asset Pricing Model) by Sharpe (1964) and Lintner (1965) and the Fama & French (1992) three factor model. Additionally, Jensen (1969) has shown that the CAPM can be used on ex post data to evaluate the performance of a company.

Two alternatives to estimating the required rate of return are used. The first one is the CAPM, where the risk factor β is assumed to capture all risk. The second one assumes that the closed-end investment company has a well-diversified portfolio and that no risk adjustment in excess of the market risk is necessary on the portfolio level.

4.2.4.1 Risk adjustment using CAPM – alternative A

For the CAPM, a β estimate from SIX Findata is used for the Swedish data. That estimate is a based on the past 48 months of trading[100]. Should no β estimate is available, an assumption is made that the β is identical to the one presented at the first available subsequent date[101]. For the British data, the β is estimated using monthly market data for the past 48 months[102]. In the case of no data, the same assumption is made as for the Swedish data. Thereafter, a risk adjusted required rate of return on equity is calculated using the CAPM, which means that

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[100] The SIX β estimates have been tested by estimating β using 48 months and monthly returns.

[101] This is the case for newly quoted companies.

[102] The β estimate is obtained by estimating $r_E - r_f = \alpha + (r_m - r_f) \times \beta_E$ for each year end and company. r_E is the cum dividend return during the month. r_f is the return on a 30-day treasury bill at the relevant geographic market. If no such measure is available, a bill or bond with longer time to maturity is used. r_m is measured as the Morgan Stanley cum dividend index for the market.

$$r_E = r_f + (r_m - r_f) \times \beta_E \tag{4.9}$$

r_f = risk free rate of return
r_m = market rate of return

Finally, the required rate of return on the total portfolio of securities has been estimated according to 4.10.

$$r_{u,t} = r_{E,t} \times \frac{E_{t-1}}{nfl_{t-1} + E_{t-1}} + \frac{\text{net financial expenses}_t}{nfl_{t-1}} * \frac{nfl_{t-1}}{nfl_{t-1} + E_{t-1}} \tag{4.10}$$

Assumption A:6 in chapter three states that the market value of net financial liabilities is identical to its book value. This means that the net interest rate is close to the required rate of return. Deviation can occur when the levels of net financial liabilities changes during period. However, the observed net interest rate is used to estimate the required rate of return on net financial liabilities[103].

The last decomposition required is between the required rate of return on quoted and unquoted securities respectively. The unquoted securities do not have any market data to use for such an estimation, which forces an indirect estimation through the required rate of returns on net operating assets and quoted securities. Weekly or monthly data on the return on quoted securities is not readily available which makes the estimation of a correct beta for these assets impossible or at least based on few observations[104]. Two empirically feasible alternatives exist. First, it could be argued that β_{nqs} is equal to one due to extensive diversification. Second, it may be assumed that quoted and unquoted securities have the same risk level. In that case the estimated required rate of return of net operating assets is applicable for both sub-portfolios. In order not to make any arbitrary assumptions, the same required rate of return is used for both sub-portfolios.

$$r_u = r_{nus} = r_{nqs} \tag{4.11}$$

[103] Sensitivity tests have been done during the early stages of the project indicating no effects if another measure of required rate of return on net financial liabilities is used. Using the CAPM with a β_D of 0.25 has been.

[104] Quarterly or annual data could be used but the number of observations would then be too small to obtain stable results.

4.2.4.2 No specific risk adjustment – alternative B

Another way to obtain the required rate of return is to start with an estimate of the required rate of return on either the sub-portfolios or the return on net operating assets. This could be done by either estimating a risk measure (like β) for the relevant asset bases and from there derive the required rate of return on net asset value. The most common way of presenting the performance of a closed-end investment company is to compare the realized return with an index[105]. This assumes that the risk in the portfolio is approximately identical to the market risk in order to make the comparison valid. Since one of the key characteristics of a closed-end investment company is to provide its owners with diversification, the second alternative is to assume that the required rate of return on net operating capital is the market return on a well-diversified index. By acknowledging the previous assumption about market valued net financial liabilities, the required rate of return on net asset value can then be calculated as follows,

$$r_{E,t} = r_{m,t} + \left(r_{m,t} - \frac{\text{net financial expenses}_t}{\text{nfl}_{t-1}} \right) \times \frac{\text{nfl}_{t-1}}{\text{E}_{t-1}} \qquad (4.12)$$

In this case $r_{m,t}$ is identical to $r_{noa,t}$.

4.2.5 The residual return contribution

The residual return contributions can now be calculated using combinations of the total return and required rate of return measures. Each regression specified in 4.1 through 4.4 is then estimated twice using different operationalizations of the required rate of return components. In table 4.1, the combinations are shown and the regression in which they are used can be seen in the intersections of the total and required rate of return measures. The a and b versions of the regressions indicate which required rate of return measure that is being used.

[105] See for example the annual reports issued by the companies and articles in business magazines and newspapers, like Dagens Industri, Affärsvärlden etc.

	None	r_E alt A	r_E alt B
$RNAV_t^{eat}$ (4.5)		$RRC_{nav,t}^{eat}$ 4.1a, 4.3a	$RRC_{nav,t}^{eat}$ 4.1b, 4.3b
$RNQS_t$ (4.7)		$RRC_{nqs,t}$ 4.2a, 4.4a	$RRC_{nqs,t}$ 4.2b, 4.4b
$RNUS_t$ (4.8)		$RRC_{nus,t}$ 4.2a, 4.4a	$RRC_{nus,t}$ 4.2b, 4.4b
Admin. expenses	$RRC_{adm,t}$ 4.1 – 4.4		
Taxes	$RRC_{tax,t}$ 4.1 – 4.4		

Table 4.1: Employed measurement technique in each regression

4.2.6 Expectations of future residual return contributions

One of the most critical parts of the operationalization is to determine how the expectations of the valuation attribute are formed. The theoretical valuation model only outlines the link between the expectations and premiums. The way the expectations are formed for periods 1 to T+1 is not previously discussed or determined within the theoretical model. The purpose of this section is to clarify the underlying assumptions regarding how these expectations are formed. The issue can be divided into two parts. The first one concerns from which time period data is taken and the second one concerns which functional form that should be used. The issue of time periods focuses on whether past or realized residual returns are used and why. Once that decision is made, it is reasonable to ask the question whether a linear functional form is sufficient to capture the expected empirical characteristics of the formation of expectations.

4.2.6.1 Formation of expectations

One of the most convenient and frequently used assumptions about the expectations is to use historical data to assess future earnings or returns[106]. A time series model is then sometimes estimated and the predicted values are used as input in the valuation regression. All models trying to link past residual return contributions to expected future residual return contributions assume that there is substantial persistence in the measures. As has been shown in chapter two, previous research documenting performance persistence is limited for closed-end investment companies. Reputation for good performance should be built on consistent performance and not only on single year achievements. In order to capture this characteristic, a three-year historic average of the residual returns has been used in this study. Additionally, a more long term average has the benefit of potentially capturing the effects of conservative valuation procedures discussed in chapter three. Consequently, this three-year average is the measure of current expectations based on historic data that is used here, i.e.

$$E_t\left[\mathrm{RRC}^{\mathrm{eat}}_{\mathrm{nav,t+1}}\right] = f\left(\sum_{\tau=t-2}^{t} \left(\mathrm{RNAV}^{\mathrm{eat}}_{\mathrm{t}} - r_{E,\tau}\right) \Big/ 3 \right) \tag{4.13}$$

$f(\bullet)$ indicates some functional form of the expression within parentheses

The historical and ex post data is simultaneously used as potential independent variables in the regression models.

Second, an alternative would be to use analysts' forecasts. Unfortunately, no such forecasts are available for closed-end investment companies.

A third measure, which is the most widely used one in this study, assumes a good match between current expectations and future realizations of the valuation attributes. If this is a valid assumption, ex post realization can be used as a proxy for expectations. A strong version of the assumption is applied here, namely that the relationship holds year by year and not only on average. Consequently, no averaging is made when ex post data is used. The

106 See for example Malkiel (1977) and (1995) who uses historical NAV return to explain premiums.

mathematical representation of the expectations formation is using RRC_{nav} as an example

$$E_t\left[\mathrm{RRC}_{\mathrm{nav,t+1}}\right] = f\left(\mathrm{RRC}_{\mathrm{nav,t+1}}\right) \tag{4.14}$$

4.2.6.2 The functional form

The second part of the operationalization issue, the functional form, has two steps. One is the relationship between the determinants of future expectations and the expectations, i.e. the issues that are discussed in this section and the other one is the mapping from the expectations to the value/premium of the company. The literature is completely dominated by the linear relationship in both of these dimensions. A few alternatives can be identified, but they are all related to the forecasting process of the valuation attribute[107]. The linearization of the theoretical models (Feltham & Ohlson (1995)) and the simplicity of the forecasting model might have influenced the use of linear relationships in empirical tests.

The two dimensioned problem makes it difficult to draw any conclusions about the relationship between expectation determinants and the intrinsic value. If both dimensions are characterized by non-linear relationships, and the two relationships are not the same, the mapping from the expectations determinants to the premium depends on their relative influence. A few conclusions from prior literature can be drawn. It appears that when conservative accounting procedures are employed a non-linear time series model performs better than a linear one for estimating ROE (Harris & Nissim, 2003 and Biddle et al., 2001). Translated into the present model, it seems that a non-linear relationship could work better for unquoted securities given that any persistence exists. Moreover, the fundamental valuation model does not prescribe a linear relationship[108]. Due to growth

[107] Runsten (1998) used an arctan model to generate expectations. The implication of such a functional form is that extreme positive and negative levels of the expectation attributes have little additional effect on future expectations. Harris and Nissim (2003) use a quadratic approach to measure the convergence in ROE, with the effect that the mean-reversion is higher when the absolute values of ROE are high.

[108] This is thoroughly explored by Biddle et al. (2001).

effects of profitability the relationship takes on an exponential shape[109]. These observations in previous literature and the underlying modeling call for inclusions of non-linear relationships between the determinants of expectations and the premium of the closed-end investment companies. Two functional forms are tested. These are the linear and the cubic forms. The linear form is the functional form most widely used in previous study. Consequently, it is a natural candidate to include in the regression models. The cubic form is, for certain parameter levels, similar to the exponential shape discussed above. The inclusion of the cubic form can be seen as a way to control for and test these non-linearities. The cubic form is only included for past measures of the residual return contributions from unquoted securities and net asset value. These are the two measures that could be affected by conservative/aggressive measurement principles. The expectations of future residual return contributions are modeled according to 4.15 when the cubic form is used.

$$E_t\left[\mathrm{RRC}_{\mathrm{nav,t+1}}\right]=\left(\sum_{\tau=t-2}^{t}\left(\mathrm{RNAV}_\tau - r_{E,\tau}\right)\Big/3\right)^3 \qquad (4.15)$$

Apart from arguments for a non-linear relationship made above, an empirical observation must be acknowledged. The possibility of correctly inferring small negative or positive residual return contributions is probably less than for large observations. This is strictly due to the difficulties of finding good proxies for expectations of future residual return contributions whereby noise may be included, i.e. an operationalization issue. In order to test the underlying model, this must be seen as a confounding observation and something that should not affect the modeling. The usage of non-linear relationships might alleviate such operationalization problems and should therefore be taken into account when the empirical results are analyzed. The problem is likely to be most severe for the cubic form.

The operationalizations presented above have some implications for the expected coefficients. The expected coefficients on the residual return contributions given the operationalizations can be summarized as follows:

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[109] The exponential shape is based on the relationship between expectations and intrinsic value or with a constant strength of the mean-reversion independent of the starting point for returns. If for example the mean-reversion behavior is stronger in the tails of the underlying return distribution, then a relationship based on the arctan function is valid.

The expected sign of all variables using future realizations as proxies for expected total returns is positive.
The expected sign of all variables using historical data as proxies for expected total returns is indeterminate, since it depends on the continuity of historical data and the degree of conservatism. High degree of continuity suggests a positive coefficient and high degree of conservatism with non-continuous investment suggests a negative coefficient. High degree of conservatism combined continuous investments and reasonable growth suggest a positive coefficient.

4.3 Operationalization of diversification/-concentration and agency variables

In chapter three, section 3.5, the issue of ownership structure and its effects on the value of the minority held shares are discussed. Two categories of variables are identified which are meant to capture the influence on premiums. These categories are
PCON, portfolio concentration, which captures the inability to influence portfolio composition and given heterogeneous beliefs a concentrated portfolio would be preferable; and
M, controlling power, which captures cases where a small but influential group of shareholders potentially uses the closed-end investment company based on their preferences and this potentially harms the non-influential shareholders.

The empirical measurement of the two categories is discussed below.

4.3.1 Portfolio diversification/concentration (PCON)

Portfolio diversification/concentration is included in the model to capture the effects of heterogeneous beliefs among the investors on premiums. Empirically, a measure of portfolio concentration is used here instead of diversification. The measure of concentration is used both in itself and in combination with a measure of ownership concentration to measure controlling power as is seen below. For the measure of controlling power, both components should have the same effects on premiums when the variable increases. Increased ownership concentration is assumed to decrease premiums. Increased portfolio concentration combined with ownership concentration is also assumed to decrease premiums.

Portfolio concentration refers to how much of the value of the total portfolio that a limited number of shares account for. Two issues have to be determined. These are the relevant portfolio of securities to measure concentration and what constitutes a limited number of shares. By addressing the relevant portfolio the focus is set on whether this includes the total portfolio of securities, or only one of the sub-portfolios. Unquoted securities have previously been treated separately and they are potentially subject to conservative accounting principles, which affect their value. Non marked-to-market valuation will then distort comparisons when it comes to proportions with assets that are marked-to-market. From this perspective, the unquoted securities can be seen as a special activity for the closed-end investment companies and portfolio diversification is obtained through the quoted securities. Moreover, unquoted securities may have additional risk that is not included in ordinary diversification arguments, such as liquidity risk and firm specific risk that might be priced on an imperfect market. The measure of portfolio concentration is then only directed towards the sub-portfolio of quoted securities.

The concept of a limited number of shares to capture concentration depends on intention and the market perception. The narrowest definition would be to only include the largest holding. Such a measure would classify low to medium large holdings as such while the portfolio can be composed of a small number of equally sized holdings that together ought to classify the portfolio as concentrated. On the other hand too many holdings would eventually classify almost all portfolios as concentrated. Without any guidance from previous research, this study uses the percentage of the three largest quoted holdings in the portfolio of quoted securities as the measure of portfolio concentration[110], i.e.

$$\mathrm{PCON}_t = \frac{\mathrm{MV}(\text{three largest quoted holdings})_t}{\mathrm{MV}(\text{quoted securities portfolio})_t} \tag{4.15}$$

[110] Tests have also been performed using the largest and the two largest quoted holdings. Moreover, total securities as the basis have also been used. The measure in 4.15 has performed the best.

The expected sign on the coefficient is positive.

4.3.2 Controlling power (M)

One or few influential shareholders may use their legal right to run the company to obtain various pecuniary and/or non-pecuniary benefits at the expense of the non-influential shareholders. In order to use this right without destabilizing effects due to divergent perceptions, the group of influential shareholders must be an individual or an identifiable close group of people with congruent targets. The most obvious examples are a business group where various subsidiaries hold parts, but where group policy on these matters can be assumed to be uniformly determined, and a family, where family members or family owned associations are the owners.

Ownership can be defined either in terms of percentage of capital rights or voting rights. For the influential shareholders to use its power, the relevant measure is the percentage of voting rights held by this group of companies or individuals. This measure of formal power can be accentuated by using shares with different voting rights. Substantial influence can be obtained with a limited capital contribution. The Swedish companies use such shares extensively. In order to capture this disproportional influence, the ratio of voting rights to capital rights is used in this study as the measure of ownership concentration (V/C). For British closed-end investment companies shares with different voting rights are not used. In this case the percentage of voting rights is used, which is identical to the percentage of capital rights.

Additional test using the percentage of voting rights held by the largest owner for Swedish companies are also performed for comparability. For both country samples, tests using the percentage of capital rights are included for completeness. The measure of voting and capital rights for the British sample is the percentage controlled by the largest beneficial owner[111]. The percentage controlled by the largest fund manager is used as a measure for sensitivity test.

[111] The word largest is used to capture the group of companies or people that control the highest percentage of votes.

It can be argued that power is captured by the measure proposed above. However, they are all measures of formal power, but they are no indicators of controlling power. If the majority shareholder has a reputation for not using her formal power then at most a small value effect is expected. The ownership concentration measures then capture whether generally there is a reputation or a fundamental perception that private benefits are extracted or not. This is, however, not identical to stating that power is always for controlling purposes or that private benefits are always extracted.

	Low portfolio concentration	High portfolio concentration
Low ownership concentration	Pure diversification median value effect	Positive value effect due to portfolio concentration
High ownership concentration	High formal but low controlling power, some negative value effect	High controlling power, negative value effect

Figure 4.1: The expected value effects from the combination of portfolio and ownership concentration

A distinction is necessary between pecuniary and non-pecuniary benefits. Pecuniary benefits should eventually be measured by the administrative expense variable discussed above. In this case, the target is to find an appropriate proxy for the effects of non-pecuniary benefits. These benefits may be analyzed as an increased risk for the minority shareholders. The risk is materialized as for example large holdings in some securities or rigidity in the ownership of some securities. Apparently, two dimensions are necessary to measure the concept of controlling power. These are formal power and an indicator of power usage. The formal power measures are described above. The indicator of power usage employed here is the portfolio concentration variable. A highly concentrated portfolio given formal power is seen as an indicator of controlling power. This is illustrated in figure 4.1.

In the regressions, a variable called M is included. This variable is an interaction variable between the formal power measure and portfolio concentration. The regression variables are defined as below for the different measures of ownership concentration.

$$M_1 = PCON \times V/C$$

$$M_2 = PCON \times \text{Percentage of votes controlled by the largest fund manager}$$

$$M_3 = PCON \times \text{Percentage of votes controlled by the largest beneficial owner}$$

The expected sign on the coefficient is negative and larger than the coefficient for PCON.

5 Institutional setting and market environment

The Swedish capital market has undergone substantial changes during the past 30 years. The most fundamental change occurred in the early 1980s when the market was deregulated. As a consequence the relative roles of the financial intermediaries and the individual investors on the market have effectively changed. These changes and the effects on closed-end investment companies are discussed in this chapter.

In addition to the deregulation, the tax laws has changed a number of times. This is important for two reasons. First, it is within the tax laws that the closed-end investment companies are defined. Second, the tax laws stipulate one of the core expenses for the closed-end investment companies, the taxes. The combination of the definition of the closed-end investment companies and the conditions in the tax laws have substantial implications for the behavior of the companies. An example of this is the level of dividends distributed to the shareholders of the closed-end investment companies, when the restrictions in the Swedish tax laws were removed, (see section 5.2.1). The most dramatic changes in the Swedish tax system took place in 1991. They affected both the individual investors and the closed-end investment companies.

The British capital market and tax laws have been stable during the investigated time period[112]. Although some minor changes have occurred, the fundamental structure has remained unchanged. The requirements affecting company behavior are much more detailed in Great Britain than in Sweden. Moreover, the requirements are more restrictive for British companies than for Swedish ones. This is most striking with respect to diversification and distribution of dividends. A comparison between the two countries is provided combined with a discussion about the effects on behavior and expected empirical findings.

Finally, the development of the stock markets in both Great Britain and Sweden during the past 30 years are described. Both the return levels and the

[112] In the British case all references address the situation for investment trusts. For a discussion about investment trusts see chapter 1.

volatility of returns have been high compared to a historic mean. The national indices mirror the composition of companies and industries on the respective stock exchanges. Obviously, the closed-end investment companies may choose investment portfolios that differ from the composition of the national indices. This can be done in at least two ways; (1) by focusing more or less on a specific industry or on an international market and/or (2) by investing in unquoted securities. Nevertheless, the closed-end investment companies tend to compare their returns to national indices as a measure of performance. The evaluation of return relative to a national index may result in a situation where risk may not be accurately corrected for. The comparison could be seen as a measure of residual returns. The impact on the measurement of residual returns given the history of market development may be substantial. This is further elaborated in this chapter.

The chapter is structured as follows. The structure and functioning of the capital markets and their evolution during the period 1972 - 2004 are presented in section 5.1. The content and changes in the tax laws are discussed in section 5.2. The impact of the market indices as benchmarks are elaborated in section 5.3. Finally, section 5.4 contains a summary of the effects on empirical testing.

5.1 The structure and functioning of the financial markets

The access to the financial markets by individual investors may have an effect on how these investors perceive different investment alternatives. On a well-functioning financial market expected risk and return are argued to determine prices. According to the traditional portfolio theory a rational investor uses the market portfolio and a risk free asset to construct his/her own portfolio (e.g. Sharpe, 1964; Lintner, 1965). Delegated portfolio management is valuable if investment expertise in excess of the market can be bought and materialized over time. Diversification is not seen as value creating unless it can be obtained at a lower cost through a financial intermediary than by an individual investor. If the financial markets are not accessible to investors in general or accessible but at a large cost, the value of diversification may be different. For example a regulated market reduces the possibilities for individuals to diversify[113]. This means that a rational investor might be willing to pay something to obtain diversification on such a market.

5.1.1 The Swedish stock market

The activity on stock market increased by approximately 2 600 % from the mid-1970s to the mid-2000s as a percentage of total market value. The annual turnover was about 5 % of total market value in 1977 (see figure 5.1). High personal tax rates on capital gains and income meant that active portfolio management by individual investors was very costly. Inactive diversification from the investor's perspective through a closed-end investment company was then an easy way to obtain the long-term benefits from investing in shares. Moreover, this was a relatively inexpensive way to obtain diversification. As a result individual investors were passive and they obtained diversification mainly through financial intermediaries. One of the major intermediaries was the closed-end investment companies. The observation that the market value of closed-end investment companies was about 38 % of the households' total investments in shares in 1981 and 18 % of the total stock market value further substantiates the relative position of the closed-end investment companies (see figure 5.2)[114].

Starting in 1981, a process of deregulation of the Swedish financial markets began. The market for interest bearing securities provided investors and banks with new opportunities and the Swedish Central Bank started floating new kinds of bonds and bills. Tax incentives for investments in shares through a new kind of open-end investment company added to the new interest for the stock market[115]. Both Swedish and international investors became more active. Turnover as a percentage of market value increased nine times within five years from 1979 to 1983, as is shown in figure 5.1

[113] A regulated market is a market with limited access by individuals due to for example an inferior infrastructure, legislative restriction and/or substantial tax wedges.
[114] The relative position of the closed-end investment companies on the stock market was even more pronounced in the 1970s.
[115] "Allemansfonderna" was introduced on the market.

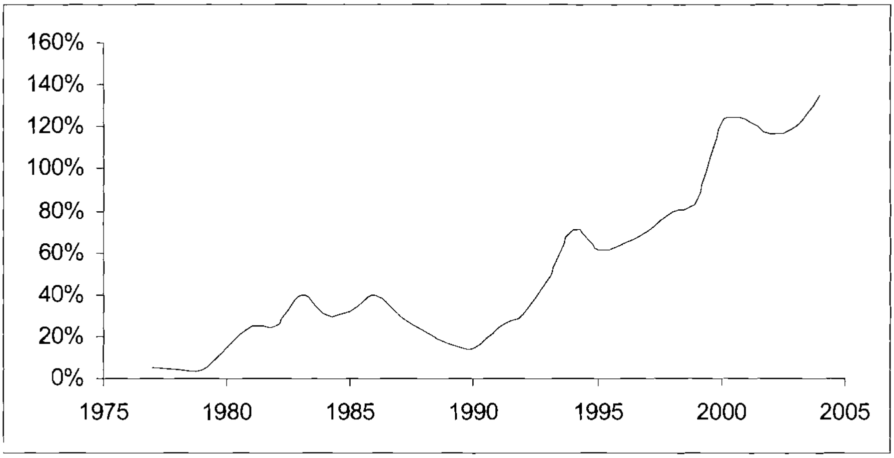

Figure 5.1: Annual market turnover on the Stockholm Stock Exchange as a percentage of market value
Source: Statistiska Centralbyrån (SCB), Statistiska meddelande serie K och Statistisk Årsbok

The demand for the new kind of open-end investment companies surged. The open-end investment companies benefited from easy customer access through the banks. In 1980, the open-end investment companies had a market value of about one-tenth of the closed-end investment companies[116]. In 1986, the two categories of investment companies were of equal size. Today the market capitalization of the closed-end investment companies is only one-fifth of the open-end investment companies'. The development of the two kinds of investment companies is shown in figure 5.2.

At the same time the direct investments in shares made by households declined substantially and consistently from 1980 and onwards. The decline, combined with the increase in open-end investment companies, indicate that individual investors have not changed their presence on the stock market, but the nature of their presence has changed. The change in ownership structure has changed the role of the closed-end investment companies. Institutional investors, like open-end investment companies, can provide diversification themselves to their owners. This means that no added value is provided by

[116] Given the negative premiums on closed-end investment company the portfolios managed by the closed-end investment companies was even larger relative to the open-end investment companies at the time.

the closed-end investment companies in terms of diversification, since alternatives exist. They must offer their owners investment expertise, business knowledge to the portfolio companies or something else.

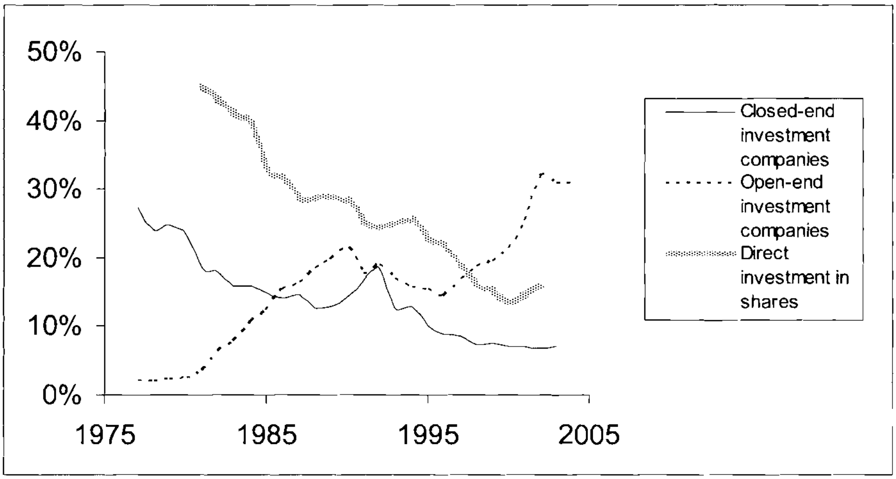

Figure 5.2: The market value of Swedish closed-end and open-end investment companies and households' investments in shares as a percentage of total stock market value

Source: Statistiska Centralbyrån (SCB), Statistiska meddelande serie K och Statistisk Årsbok

The following conclusions can be drawn from the period 1972 – 2004 on the Swedish stock market:

- stock market activity has increased substantially;
- direct investments in shares has decreased as a fraction of total market value;
- investments through open-end investment companies has increased substantially; and
- closed-end investment companies has not been able to defend its relative position as a financial intermediary on the stock market.

5.1.2 The British stock market

By comparison the development on the London stock exchange is much more stable. The annual turnover as a percentage of total market value was low but very stable during the first half of the 1980s (see figure 5.3). The institutional environment was structurally unchanged during the time. The peak in 1987 is due to the crash in October that year. The market activity on that day was much larger in London than in Stockholm.

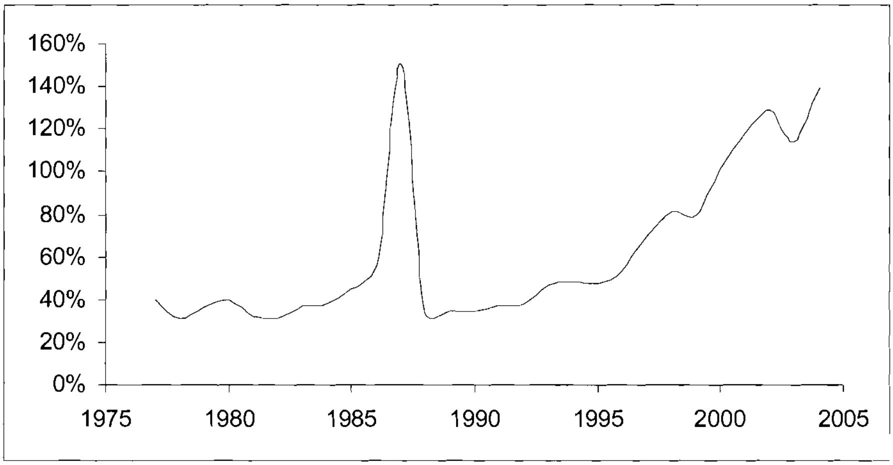

Figure 5.3: Annual turnover on the London Stock Exhange as a percentage of total market value
Source: London Stock Exchange homepage.

The structure of the British stock market with respect to the relative influence of closed-end and open-end investment companies is also more stable than the Swedish case. The closed-end investment companies have steadily had a market value of one to two percent of total market value[117]. This is a much lower level than in Sweden. The open-end investment companies increase their market share over time, but they start from a higher level than in Sweden and they eventually reach a level that is about one-fifth of the Swedish level in terms of percentages. In addition, a marginal decrease of two percentage points in household share ownership is shown. The ending proportion of household direct ownership of shares is about six percent of total market value (see figure 5.4[118]).

[117] Due to the negative premiums, this means that the market value of the portfolio of securities in the closed-end investment companies was about 1.5 – 2 % of total market value.
[118] The values for 1977 through 1980 and 1982 through 1991 are interpolated for the household and open-end investment company figures. Data have only been obtained for 1976 and 1981.

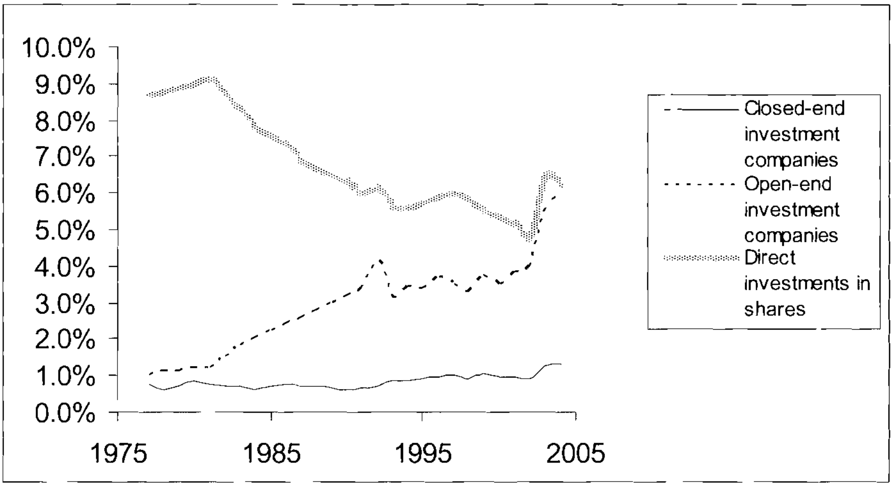

Figure 5.4: The market value of British closed-end and open-end investment companies and households' investment in shares as a percentage of total stock market value.
Sources: Datastream, the Association of Investment Trust Companies (AITC) homepage, Investment Management Association (IMA) homepage and the National Statistics homepage.

The following conclusions can be drawn for the British stock market:

- The market has not experienced as major changes as the Swedish financial markets;
- direct investments in shares has decreased as a fraction of total market value;
- investments through open-end investment companies has increased substantially; and
- closed-end investment companies has maintained its position on the stock market, but declined relatively to the open-end investment companies.

5.1.3 Proposed estimation effects due to market changes and differences

The changes in the structure of the Swedish financial market and the behavior of the households can affect the estimation of the coefficients in the regression models. Consequently, all empirical tests are made separately for the time period starting in 1981 and for the full period of 1972 – 2004. Additionally, due to the observed changes in the role of closed-end investment companies as providers of diversification, this has to be controlled for. The discussion above leads to an expectation of a less significant effect on premiums from diversification prior to 1981.

In order to capture the change in the premuim effect from diversification due to a more regulated market prior to 1981 a dummy variable is constructed. The dummy is equal to 1 for observations prior to 1981 and 0 otherwise is constructed. The dummy is multiplied with the portfolio concentration variable.

5.2 The structure and effects of the tax systems

The tax laws in Sweden and the UK define two critical dimensions in order to determine the tax expenses for a closed-end investment company. First, the definition of a closed-end investment company or, in the British case, investment trust is provided. Necessary characteristics of the company are determined. These characteristics have immediate effects on the behavior of the company if any tax relief should be obtained. Second, the obtainable tax relief is specified. The design, characteristics and effects of the tax laws during the period 1972 – 2004 are presented for each of the two countries below.

5.2.1 The Swedish tax system

In the Swedish tax system, a qualitative definition of a closed-end investment company is used.

> *"An investment company is a Swedish stock corporation or a Swedish incorporated association which*
> - *exclusively or almost exclusively manages securities or similar personal property,*

- *whose main purpose is to offer the shareholders risk diversification through a well diversified portfolio of securities, and*
- *in which a large number of individual investors own shares.*"[119,120]

The required level of diversification is the most complicated part of the definition. No distinct levels of portfolio diversification are given in the definition. Court rulings have shown that the requirement is not met if less than half of the market value of the closed-end investment company is attributable to quoted securities[121]. This level is perceived as the bottom threshold for diversification. The quoted closed-end investment companies in Sweden during the studied period are much more diversified in terms of market value than this. It is important to note that the threshold based on market value does not give a definition based on the content of the portfolio of quoted securities. No court rulings have been found that specify the necessary degree of diversification within the portfolio of quoted securities. Companies in Sweden, e.g. Latour, have portfolios of quoted securities where the largest holding is more than half of the quoted holdings (Annual reports from Latour 1986 – 2004). The degree of diversification is generally a concern when a company changes its characteristics to become a closed-end investment company from having been a manufacturing company. Such transitions are rare nowadays.

The registration contract at the Stockholm Stock Exchange includes clauses which require a widespread owner base. A quoted closed-end investment company has to fulfil the ownership criterion.

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[119] Swedish text from Inkomstskattelagen chapter 39 § 15: "Med investmentföretag avses ett svenskt aktiebolag eller en svensk ekonomisk förening
- som uteslutande eller så gott som uteslutande förvaltar värdepapper eller liknande tillgångar
- vars uppgift väsentligen är att genom ett välfördelat värdepappersinnehav erbjuda andelsägarna riskfördelning, och
- som ett stort antal fysiska personer äger andelar i."

[120] Translated from Swedish to English by the author.

[121] The benchmark was obtained given that the remaining part of the portfolio consisted of a few subsidiaries (court case RÅ 1991 ref 88). The level of diversification is not thoroughly determined in the case where the remaining portfolio consists of many small holdings in unquoted securities.

The taxable part of generated earnings in a period has changed over time. Up to 1990, capital gains were taxable and losses were tax deductible. However, only 40 % of capital gains on shares held for more than two years were taxable[122]. Capital gains on shares held for less than two years were fully taxable. Since the statutory corporate tax rate amounted to about 55 %, the effect on taxes paid could be significant[123]. Effectively, this system constructed incentives for the closed-end investment companies to maintain a low portfolio turnover and/or transactions the net capital gains and losses in the same fiscal year.

Dividends were not taxable given a certain dividend policy. If the closed-end investment company maintained a policy where at least 80 % of received dividends were distributed to the company's shareholders, all dividends became non-taxable. 20 % of received dividends could be reinvested without tax consequences. Proportional tax exemption for dividends was obtained if a closed-end investment company chose to distribute less than 80 % of its received dividends. Figure 5.5 shows that the dividend spread (received dividends less distributed dividends) was positive and close to relationsship stipulated in the tax laws for total tax exemption until the late 1980s. Thereafter, the Swedish closed-end investment companies have chosen to distribute more dividends than they have received on average. The substantial distributed dividends are partly due to a few extra dividends in form of shares that some companies have made.

After 1990, all taxation is effectively eliminated. Capital gains are not taxable and losses are not tax deductible. On the other hand, all portfolio income, i.e. dividends, and interest income are taxable income. A revenue component of two percent of the market value of the portfolio of quoted securities is added to taxable income. This is done in order to eliminate the difference between the corporate tax rate of 28 % and the personal tax rate of capital gains/income of 30 %. Distributed dividends are tax deductible. Interest expenses and administrative expenses are tax deductible. As a result, as long as the closed-end investment company manages its dividend policy taxes paid can be negligible.

[122] Prior to 1976, taxable gains were only 10 % of the sales revenue if the sold shares were held for more than five years.

[123] The corporate tax rate was determined by a combination of a state tax and a municipal tax. Between 1972 and 1988 the tax rate was effectively 52 to 58 % (see calculations in Runsten, 1998). In 1989 it decreased to 40 % and in 1991 it reached its current level 30 %.

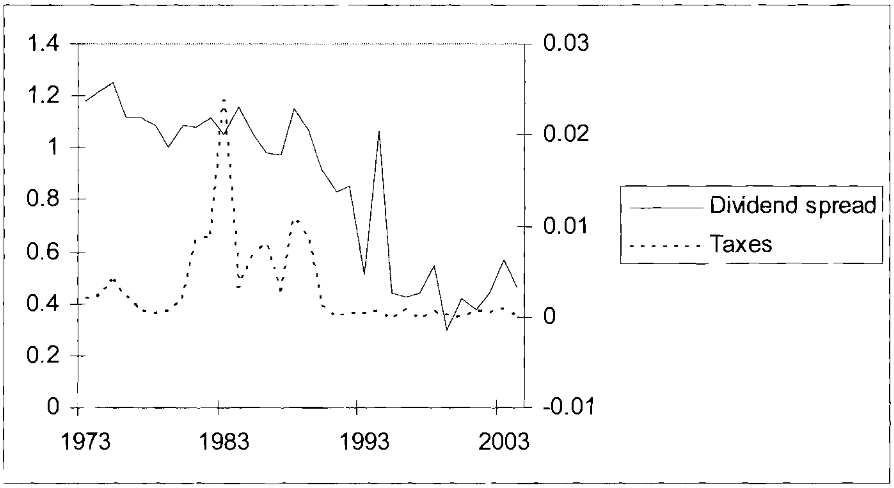

Figure 5.5: Tax expenses and the ratio between received and distributed dividends for Swedish closed-end investment companies 1973-2004. The graph shows cross-sectional means for the Swedish closed-end investment companies over time. The dividend spread shows received dividends divided by distributed dividends measured on the left Y-axis. Taxes are divided by total assets at the beginning of the year measured on the right Y-axis.

Calculations of expected taxes as a percentage of net asset value during the different structures of the Swedish tax system are presented in table 5.1 Assumptions for the calculations and a description of the Swedish tax system from 1972 to 2004 is presented in appendix 5.1.

	-1975	1976-1989	1990	1991-1993	1994	1995-
Percentage of portfolio of shares	0.3 – 3.8 (1.4)	1.2 – 4.0 (2.0)	1.1 - 3.2 (1.7)	0 – 0 (0)	0 – 0 (0)	0 – 0 (0)

Table A5.1.1: Expected yearly taxes as a percentage of the market value of the portfolio of shares at the beginning of the period. The limits of the range show maximum and minimum levels given certain standard values. The figure within parenthesis is a value for the case where 30 % of the portfolio consists of short-term investments and 70 % of the portfolio consists of long-term investments.

The effects of the change in the Swedish tax laws and the market conditions are described in figure 5.5. It can be seen that the total taxes as a percentage of total assets are highest during the mid-1980s, when the stock markets rose dramatically and capital gains were taxable. During the slow 1970s on the capital markets, taxes were less than 0.5 % of total assets. After the tax reform in 1991, taxes have been almost entirely eliminated.

5.2.2 The British tax system

The British tax system separates investment income, i.e. most importantly dividends. Investment income is treated equally for all corporations and individuals in order not to generate any double taxation. Capital gains/losses are taxable/deductible based on the capital gains tax rate. Since there is a general tax relief for investment income, the tax laws for closed-end investment companies are designed to define when capital gains are not taxable[124].

The elimination of double taxation on investment income is handled by a tax system called the imputation system. Dividends distributed from a company out of taxed earnings carry a tax credit. The tax credit is equal to the tax paid by the company. The tax credit can be used to offset corporate or personal taxes on the received dividend. In practice for income calculation, the received dividends are grossed up with the tax credit and a tax expense is recorded even though no tax payments will occur for a closed-end investment company. The tax expense and portfolio returns will be inflated relative to dividends received and tax payments. The after tax net asset value return is unaffected. The dividends received that carry such a tax credit are called franked investment income.

Prior to 1977, closed-end investment companies paid full taxes on capital gains. In 1977, the capital gains tax rate was reduced to 10 % and in 1980 the taxes on capital gains was removed. From 1980 the British companies can buy and sell shares entirely based on economic considerations, as the Swedish companies can from 1991. The British closed-end investment companies have to comply with six conditions in order to achieve exemption from capital gains taxes;

[124] From a legal point of view the tax laws are designed for investment trusts.

1. The company is resident in the United Kingdom;
2. The company's income consists wholly or mainly of eligible investment income;
3. No holding in another company represents more than 15 % by value of the holder's total investments;
4. The shares making up the company's ordinary share capital are quoted on the Stock Exchange;
5. The company's memorandum of articles of association prohibit the distribution by way of dividend of profits on realizing investments; and
6. The company does not retain in respect of any accounting period more than 15 % of its eligible investment income.

The three conditions that affect company behavior and the current valuation framework most are conditions 3, 5 and 6. Conditions 5 and 6 on dividends forcing the closed-end investment companies to retain all capital gains and less than 15 % of investment income may drive diversification. The high level of reinvestment makes total assets strongly dependent on price development on the portfolio of securities. On average and over time total assets is likely to grow faster than the underlying market since 0 – 15 % of dividends will be reinvested in excess of the value increase due to price increases.

The third condition states that a closed-end investment company is not allowed to have more than 15 % of its asset in another company or group[125]. The limitation on portfolio concentration combined with conditions that encourage growth ensures the well diversified portfolio.

In relation to the Swedish companies, the conditions are more likely to have an effect on company behavior. The restrictions related to diversification for the Swedish companies are primarily focused on the combination of quoted and unquoted securities with no explicit limitations on the portfolio concentration. In the British case the relative level of each holding to both the portfolio in the closed-end investment company and the value of the portfolio company is determined. The British companies are forced to maintain a diversified portfolio independent of whether the securities are quoted or unquoted.

[125] The inclusion of companies' is a group to determine the 15 % threshold is concluded by statements from The Inland Revenue.

All conditions on the British companies are tied to their entire treatment as closed-end investment companies. No quantified conditions for being treated as a closed-end investment company are provided for the Swedish companies. The Swedish companies may choose to pay some taxes if paying taxes is a good strategy due to other economic effects. The tax effect is only partial for the Swedish companies. The effects for a British company from not complying with the six conditions are much more severe. Effectively, this means that once you are classified as a closed-end investment company in Great Britain, it can be inferred that the company complies with the strict rules.

5.2.3 Estimation effects due to tax system differences

The difference in the requirements on diversification affects the variance in the portfolio concentration variable. The maximum level of a holding in another company is 15 % by value for the British closed-end investment companies. No such restrictions apply for the Swedish companies. The component for portfolio diversification used in this study measures the three largest quoted securities in relation to the total portfolio of quoted securities. The level of this variable can not exceed 45 % for any given company and period. A more limited range of possible values may reduce the variance of the observations on portfolio concentration. Such a lack of variance in the British sample may also cause insignificant coefficient estimates for this sample. Even if the variance is sufficiently large another issue may emerge. If the relationship between premiums and diversification/concentration is non-linear, the limited range of the independent variable for the British companies may cause insignificance.

The restrictions on diversification make the British companies less suitable for power positions. Since neither quoted nor unquoted securities can individually be more than 15 % by value, the influence on other companies is more limited. The one share – one vote structure of the British companies further circumscribes this risk. The Swedish companies may have both a more concentrated portfolio and they may have a dual-class voting rights system for their shares. Consequently, the British companies are expected to be less exposed to power effects on premiums than their Swedish counterparts.

Performance measures are expected to be less sensitive to individual holdings for the British companies than for the Swedish ones. The impact from the portfolio of unquoted companies is less substantial. The lower impact on the portfolio companies can drive a greater reluctance to invest in unquoted securities for the British companies than for the Swedish companies. Since quoted securities are expected to generate zero residual returns, the performance measure may be less volatile for the British companies than for the Swedish companies. A lack of variance and consequently correlation with premiums increase the risk for insignificant coefficient on the return measures.

Both the Swedish and the British tax laws have nowadays effectively eliminated the taxation of closed-end investment companies. This situation will drive insignificance for the coefficient on tax expenses in the regressions due to the lack of variance and the low levels. The potential tax expenses for the Swedish companies up to 1990 may cause some weak evidence.

5.3 Stock market performance

Figure 5.6 shows the development of the Morgan Stanley cum dividend index (MSCI) for the Stockholm and London Stock Exchanges for the period 1972-2004. Two things are evident from this graph. First, the stock exchanges have gone through both times of small increases, or even decreases, in value and times of extremely positive returns. The indices show an average yearly increase of 7.3 % for the British market and 3.4 % for the Swedish market for the period 1972-1979. The following seven years until 1986 show an annual increase of 25.2 % for the British market and 41.2 % for the Swedish market. The value increases during the mid-1980s are the highest experienced during the 32 years under examination here.

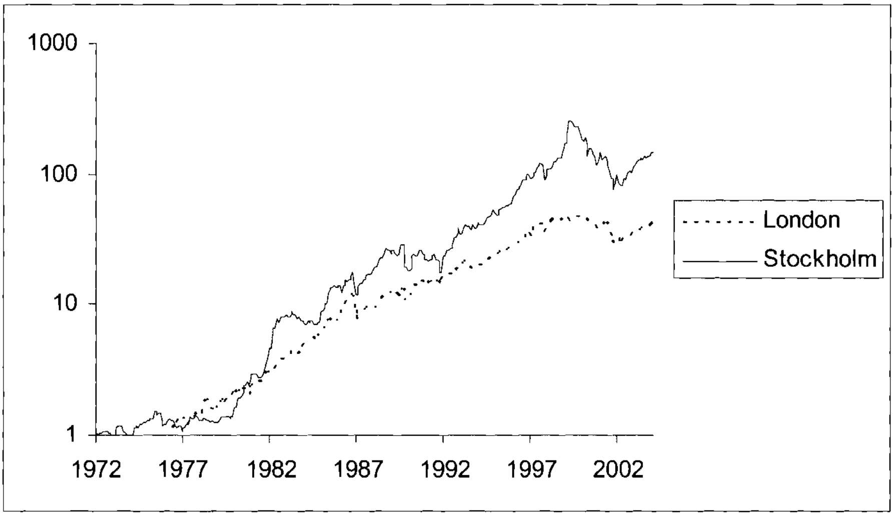

Figure 5.6 Stock market index (Morgan Stanley cum Dividend Index) for the Stockholm and London Stock Exchanges for the period 1972-2004. The index figures for each year have been divided by the index figure of December 31, 1972 for each stock exchange i.e. the lines have been normalized to 1 for December 31, 1972.

Second, the developments on the two stock exchanges are not identical. Both the recessions and the upturns are more pronounced on the Stockholm Stock Exchange than on the London Stock Exchange. At least two possible explanations for the differences can be found. First, the deregulation of the Swedish market as discussed in section 5.1 had an impact on the development during the 1980s. The renewed interest in the stock market both domestically and internationally drove prices upwards. Large amounts of capital were transferred to the Swedish stock market. Second, the industry structure on the Stockholm Stock Exchange has been biased towards pharmaceutical and high-tech companies[126]. These two industries have been the driving forces on the market, both in recessions and upturns. The London Stock Exchange has been more evenly distributed among industries[127].

[126] During the 1980s the real estate companies were an additional driving force of the market upturn and fall.

[127] A bias towards oil & gas and banks among the largest companies is identified today.

5.3.1 Estimation effects due to stock market performance

The impact on the regressions depends on the measurement of residual returns as a measure of performance. The use of realized residual returns as an unbiased measure of the ex ante expectation causes problems for two reasons. First, if the raw returns are not based on market values, the difference between the raw returns and the market value based index measure as a diversified benchmark causes short-term biased measures of value creation[128]. The most common measures of raw returns for unquoted securities are directors' valuation and accounting measures. Directors' valuation is intended to be unbiased measures of market values. The degree of conservatism in the accounting value measures is possibly large and severe with respect to measuring value creation. A negative bias in the residual return measure is expected during the market upturns. This is particularly the case for the mid-1980s and the mid- and late 1990s.

Second, the industry structure of the markets partially affects the index developments[129]. The index could be seen as a good benchmark for a well-diversified portfolio of securities. It is not a good benchmark, if a closed-end investment company has a portfolio that is biased in a different direction than the market. The index does not capture the risk inherent in the differently composed portfolio of the closed-end investment company. The entire systematic risk is then not fully controlled for. The degree of the bias in systematic risk causes more or less severe biases in the residual return measure. The sign of the bias depends on the individual year returns and whether it is a positive or negative underlying bias in the systematic risk. The impact of the residual return measure is amplified when the returns on the market are extreme in any direction.

[128] Other benchmarks can be used but as long as they capture short term fluctuations, they suffer from the same problems. Both raw and benchmark realized return measures are subject to ex post short term fluctuations. By measuring performance as the difference between the raw returns and a benchmark, the problem of short term fluctuations are expected to cancel.

[129] Note that most indices have limits on the weight an individual share may have in the index. Effectively, the index is thereby only partially affected by the industry structure.

5.4 Summary of implications for regressions and analyses due to institutional factors and market conditions

The discussions in sections 5.1 through 5.3 have resulted in two amendments to the original regressions presented in chapter five. These amendments are:

- Separate regressions for the 1981-2004 sample and the full period 1972-2004 are run. The 1981-2004 can be considered the main sample.
- The inclusion of a dummy variable for the 1972-1980 observations to be multiplied with the portfolio concentration variable. The new variable is expected to have a negative sign.

Additionally, the discussions have resulted in some observations that must be taken into consideration when the findings are analyzed. These observations are:

- The degree of portfolio concentration is expected to be lower for the British companies. If the value effects due to portfolio concentration and controlling power are non-linear the degree of significance for the variables in the British sample may be impaired.
- The higher degree of dividend flexibility for the Swedish companies can cause different actions by the British and Swedish companies. Regulation based on growth and accumulation of wealth for the British companies may also drive higher degree of diversification.
- The structure of the tax systems implies an insignificant coefficient on taxes. Potentially the years with some tax payments during the 1980s for the Swedish companies may cause a weak negative impact on premiums from taxes. The lack of tax payments for a going concern closed-end investment companies, means that any tax liabilities at a remote liquidation point in time will have a negligible present value.
- The substantial market upturns during the mid-1980s and mid- and late 1990s may drive a negative bias on the level of residual returns on unquoted securities.
- The difference in the composition of the used index (MSCI) and portfolio of the closed-end investment company may cause a bias due to differences in levels of systematic risk and realized returns.

The regression models presented in equations 5.1 through 5.4 constitutes the core parts of the empirical tests. Each of the regression models is run sixteen times for each (sub-)sample due to

- two different risk adjustments for required rate of return, beta adjustment and no adjustment;
- two time periods, 1973 – 2004 and 1981 – 2004;
- two estimation techniques, ordinary least squares and fixed effects regression to capture firm specific effects in addition to the ones included in the regression models and to limit firm-specific serial correlation[130]; and
- one estimation for each time period and model including time dummies to control for general market sentiment effects, using the no specific risk adjustment measures of required rate of return.

$$\text{Premium}_0 = \alpha + \sum_{t=1}^{T+1}\left[\beta_{nav,t}\text{RRC}^{\text{eat}}_{\text{nav,t}} + \beta_{adm,t}\text{RRC}_{\text{adm,t}} + \beta_{tax,t}\text{RRC}_{\text{tax,t}}\right] + \varepsilon \tag{5.1}$$

$$\text{Premium}_0 = \alpha + \sum_{t=1}^{T+1}\begin{bmatrix}\beta_{nus,t}\text{RRC}_{\text{nus,t}} + \beta_{nqs,t}\text{RRC}_{\text{nqs,t}} + \\ +\beta_{adm,t}\text{RRC}_{\text{adm,t}} + \beta_{tax,t}\text{RRC}_{\text{tax,t}}\end{bmatrix} + \varepsilon \tag{5.2}$$

$$\begin{aligned}\text{Premium}_0 = \alpha &+ \sum_{t=1}^{T+1}\left[\beta_{nav,t}\text{RRC}^{\text{eat}}_{\text{nav,t}} + \beta_{adm,t}\text{RRC}_{\text{adm,t}} + \beta_{tax,t}\text{RRC}_{\text{tax,t}}\right] + \\ &+ \beta_{PCON}\text{PCON}_0 + \beta_{PCONDum}\text{PCON}_0 \times \text{Dum} + \beta_M \text{M}_0 + \varepsilon\end{aligned} \tag{5.3}$$

$$\begin{aligned}\text{Premium}_0 = \alpha &+ \sum_{t=1}^{T+1}\begin{bmatrix}\beta_{nus,t}\text{RRC}_{\text{nus,t}} + \beta_{nqs,t}\text{RRC}_{\text{nqs,t}} + \\ +\beta_{adm,t}\text{RRC}_{\text{adm,t}} + \beta_{tax,t}\text{RRC}_{\text{tax,t}}\end{bmatrix} + \\ &+ \beta_{PCON}\text{PCON}_0 + \beta_{PCONDum}\text{PCON}_0 \times \text{Dum} + \beta_M \text{M}_0 + \varepsilon\end{aligned} \tag{5.4}$$

where
Dum = 1 if the observation is prior to 1981 and 0 otherwise[131]

[130] Fixed effect regressions are regressions with a different intercept for each company in the cross-section.
[131] Note that when the regressions are run for the 1981 – 2004 the PCON× Dum variable is excluded.

Part three Empirical evidence, analyses and conclusions

Part three consists of four chapters. The empirical evidence based on analyses of descriptive statistics, correlations and regression analyses is presented. The part is structured based on a separation of presentation of evidence and more in-depth analyses of performance and the effects of heterogeneous beliefs and ownership structure.

Chapter six includes the results from the empirical tests as displayed in chapters four and five. A large number of appendices is attached where more comprehensive results from the descriptive statistics, correlations and regression analyses are included. Sensitivity analyses are also available in appendices.

Chapter seven provides analyses of the performance measures and their relation to previous research. A special focus is put on the measurement of returns.

Chapter eight is focused on the effects of diversification and exercised power in the context of divergence of opinion and ownership structure. The effects of structural changes on the financial markets on the market perception of diversification are also discussed.

Chapter nine contains the final conclusions and a discussion of the results in the context of the purpose of the study presented in chapter one. Discussions of the implications of findings along with somewhat interpretations of the findings from this study for adjacent industries are also provided.

6 Empirical evidence

The overall empirical results from the tests based on Swedish and British data are presented in this chapter. The chapter should be seen as descriptive with respect to the empirical results. In section 6.1, the two data sets are presented in terms of origin and scope including the subsets of data used for special tests mainly on the Swedish sample. In section 6.2 the descriptive statistics from the samples and sub-samples are presented. In section 6.3, the bivariate correlations between the premium and its proposed determinants and internally between the determinants are presented. In section 6.4, the regression results are presented.

A list of the companies included in each sample and sub-sample is provided in appendix 6.1 for the Swedish companies and in appendix 6.2 for the British companies. The complete tables for descriptives, correlations and regression results are presented in appendices 6.3 through 6.10. The relevant empirical results discussed in a specific section are provided there in separate tables.

Regressions have been run for both the 1972 – 2004-period and the 1981-2004-period with and without control variables (portfolio concentration and controlling power). The discussions in chapters three through five shows that the correct model is expected to be with controls. This means that the regressions without controls are incorrectly specified. As a result the regression results for the 1972 – 2004 regressions without controls are not reported in this chapter (section 6.4), but they are included in the appendices. The explanatory power, i.e. R-square, is reported since it is not as contaminated by the incorrect specification as the individual parameter estimates are. The results for the 1981 – 2004 regressions without controls are kept for comparison with previous research.

6.1 Origin and scope of the datasets

Two separate sets of data are used for the empirical tests, one Swedish and one British set. Both sets contain yearly data for the period 1972 – 2004, i.e. information for 33 years. The data include both survivors and non-survivors.

Newly listed companies are included one year subsequent to their initial trading date. Only companies with at least 5 years of consecutive information are included in the regression analyses[132]. This constraint reduces the data sets with 15 to 30 % of the original observations. The number of observations discussed below does not take this into account. Regarding the British data the inclusion of companies for more remote years are directly dependent on the registration of old material in the database. The degree of non-included data has not been possible to determine. Probably, some survivorship bias is present for the older British data.

The Swedish data are assembled directly from the annual reports and they have been manually coded and entered into an Excel-file. Subsequently, the data have been imported to the statistical software Eviews to be processed. Betas have been obtained from SIX Findata/Finlis. Ownership data have been obtained from SIS Ägarservice and/or directly from the annual reports. The Swedish set contains in total (including control variables) 388 (196) firm-year observations, with a cross-section of 27 (23) firms[133]. Only 3 firms have observations for all 33 years.

The British data have been collected from Datastream. The original data set contains 3 102 firm-year observations, with a cross-section of 217 firms[134]. The Datastream data contains price, return and investment portfolio information data. The investment portfolio information data is not available for the early years, which reduces the data set considerably when such information is incorporated in the analysis. Ownership data for British closed-end investment companies have been obtained from the database Nominus. Ownership data are available only for the time period mid-1998 until today. The total number of British firm-year observations including ownership data is 407, spread over 98 firms, restricted to the period mid 1998 - 2004.

The Swedish data set is the richest one with respect to information details and the length of the time series with complete sets of data. i.e. including

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[132] The correlations are analyzed for residual return data for period t+1, t+2 in addition to the average historic residual return based on information for periods t, t-1 and t-2. This generates a demand for at least 5 years of data.

[133] Numbers within parenthesis refer to the case when matched observations for portfolio and ownership concentration exist.

[134] Note that all samples and sub-samples are unbalanced i.e. observations for all firms and time periods are not available for the data panel.

ownership and portfolio concentration data. Most importantly, portfolio return data can be constructed for quoted and unquoted shares respectively, which is not the case for British data[135]. Consequently, the empirical tests are more detailed with respect to return data for the Swedish companies than for the British ones. As mentioned above the number of firms in the Swedish sample is low. Six companies have been present for all or almost all years resulting in a situation where about 40 % of the Swedish observations come from six firms. At the end of 2004, one firm, Investor, dominates the market in terms of market capitalization. Investor is about twice the size of the second largest player, Industrivärden. Moreover, Investor is ten times larger than the third largest player, Ratos. At the end of 1972, there were five firms of about equal size, Investor, Industrivärden, Ratos, Cardo and Providentia. The concentration of firms incurs statistical and analytical consequences. The impact of the six large firms on the estimation of the statistical parameters is potentially considerable due to the large number of firm-year observation they provide. A test of the special attributes and their impact on the total sample estimates of the six firms and their allies is made by using the so called sphere sample[136]. This sub-sample contains 274 (167) firm-years and 14 firms in the cross-section.

The final split of the Swedish sample is caused by the investment strategy of the company. Companies which invest almost exclusively in quoted securities are more closely related to open-end funds and hence to their British counterparts. Moreover, companies that invest a substantial proportion of their funds in unquoted securities or even have direct operational influence over their investment objects are potentially more exposed to short-term measurement biases. In order to capture this difference, companies with a strong focus on investments in quoted securities are reported separately. This group is publicly identified in the business press and by the companies themselves. The companies included in this sample are called pure companies. This sample contains 190 (101) firm-years observations and 11 (11) firms in the cross-section.

[135] This is so since information on either one sub-portfolio return or net investments in one sub-portfolio has not been available as discussed in chapter four.

[136] The companies included are Investor, Industrivärden, Ratos, Custos, Latour/Hevea, Öresund, Bacho/Promotion, Cardo, Export-Invest, Företagsfinans, Opus, Protorp, Providentia and Säfveån.

	Swedish all companies	British all companies	Swedish sphere companies	Swedish pure companies
Samples without controls1972 – 2004	388 286	3102 2203	274 217	190 136
Samples without controls 1981 – 2004	268 212	2750 1964	202 173	123 101
Samples with controls 1972 – 2004	196 163	N/A	167 146	101 89
Samples with controls 1981 – 2004	187 154	407 365	158 137	93 81

Table 6.1: Description of the (sub-)sample partitions based on time and existence of control variables. The first number in each cell represents the number of firm-year observations available for the descriptives. The second number in each cell represents the number of firm-year observations in the regressions. The latter number is smaller due to lags used in the regressions. Note that the British sample with controls is only relevant for the time period 1999 – 2004.

Each sample discussed above, except for the British ownership sample, is also split once from a time series perspective. In line with the discussion in chapter five on institutional changes each sample is run once for the full time period 1972-2004, which are the numbers discussed above and for the shorter time period 1981-2004. The short British sample consists of 2 750 firm-year observations and 217 firms. The short but cross-sectionally almost exhaustive sample for Swedish data consists of 268 (187) observations and 27 (23) firms. The number of firms is unchanged in both samples, but while only 11.4 % of the observations are lost in the British case, 31 % is lost in the Swedish case. The short sphere sample consists of 202 (158) observations from 14 (14) firms. Finally, the pure sample consists of 123 (93) firm-years from 11 (11) firms. The number of firm-year observations is displayed in table 6.1.

6.2 Descriptive statistics

Appendix 6.3 includes descriptive statistics for all variables introduced in chapter four using the market adjusted residual return measures. Each section below contains a table with the relevant empirical observations for that specific section. Note that descriptives for residual return contributions on British data are available only on the net asset value level and that information on ownership and portfolio concentration data is reported for the period 1981 - 2004 only in panel B. All details regarding the measurement and table contents are presented in chapter four.

6.2.1 Premium levels

As can be seen from table 6.2, there are substantial differences between the premium levels of the Swedish and British samples. The Swedish companies have premiums which are on average 8-9 percentage points more negative than their British counterparts. A slight reduction in the difference can be observed for the full sample during the period from 1981-2004 to about 6.8 percentage points. These differences are statistically significant between the countries for both time periods. The median premium difference between the samples remains large, 9-10 percentage points, and it is stable over time. This indicates that the change in average premiums is entirely driven by a small number of companies exhibiting substantial positive premiums. Additionally, the level of premiums appears to have become slightly less negative over time, which is consistent with figure 1.1 in chapter one.

	Sweden all companies	British all companies	Sweden sphere companies	Sweden pure companies
Panel A: Firm-year observations December 1972 - December 2004				
Mean (Median)	-0.228 (-0.250)	-0.144 (-0.153)	-0.239 (-0.260)	-0.239 (-0.250)
Standard Deviation	0.202	0.112	0.161	0.113
Panel B: Firm-year observations July 1981 - December 2004				
Mean (Median)	-0.179 (-0.220)	-0.131 (-0.143)	-0.212 (-0.230)	-0.206 (-0.230)
Standard Deviation	0.204	0.108	0.164	0.108

Table 6.2: Descriptives statistics: Premium levels for each (sub-)sample and time period.

The standard deviations of premiums in the samples differ substantially. The standard deviation for the Swedish full sample is 80.4 % higher than for the British sample, 0.202 compared to 0.112. This can be seen as an indication of greater diversity in the Swedish sample. The more homogeneous sub-sample of sphere and pure companies respective show smaller standard deviations. In fact, the standard deviation for the pure companies sub-sample is almost identical to the British sample.

6.2.2 Residual return contributions

Table 6.3 shows the descriptive statistics for the residual return contributions. The residual return component levels are consistent with the pattern observed for premiums. The Swedish sample shows negative mean residual return contributions from net asset value, quoted and unquoted securities. The largest negative residual return contributions are found for the 1981 - 2004 period. However, the medians give a different picture. For the full period, they are close to zero and in many instances positive. Apparently, some substantially negative return observations exist in the sample. The medians for unquoted securities are almost consistently closer to zero than the medians for quoted securities. The means on the other hand show the opposite relationship, except for the sample of pure closed-end investment companies[137]. Additionally, the differences between the means and the medians are much larger for unquoted securities than for quoted securities. It is worth noting that the beta adjusted residual return components show more positive means and medians with approximately two percentage points[138]. Furthermore, when the descriptives for only the observations included in the regressions are used the means are much closed to zero.

The British sample exhibits a residual return on net asset value that is close to zero both with respect to means and medians. Means are positive and medians slightly negative. This would indicate that the returns from the portfolio management provided by British investment trusts is at least an equally good investment as an index investment, at least before the administration fees and taxes have been deducted. The similarities between means and medians are expected given the low level of unquoted securities and high degree of market valuation.

The residual return contributions from net asset is significantly higher for the British companies than for the Swedish companies from 1981 – 2004, but not for the time period 1972 – 2004 independent of Swedish (sub-)sample.

[137] This can be explained by the low weight on unquoted securities for pure closed-end investment companies due to their strategic choices.

[138] These numbers are not reported here.

	Sweden all companies	British all companies	Sweden sphere companies	Sweden pure companies
Panel A: Firm-year observations December 1972 - December 2004				
Residual return contribution: net asset value, $(RRC_{nav,t}^{eat})$	-0.023* (0.003)	0.004 (-0.002)	-0.022 (0.004)	-0.015 (0.008)
	0.246	0.221	0.226	0.190
Residual return contribution: quoted securities, $(RRC_{nqs,t})$	-0.002 (-0.001)		-0.005 (-0.005)	-0.010 (-0.005)
	0.156		0.148	0.152
Residual return contribution: unquoted securities, $(RRC_{nus,t})$	-0.021** (0.002)		-0.017* (0.002)	-0.004 (0.003)
	0.176		0.155	0.092
Residual return contribution: administrative expenses, $(RRC_{adm,t})$	0.004*** (0.003)	0.010*** (0.007)	0.003*** (0.002)	0.003*** (0.003)
	0.004	0.009	0.002	0.003
Residual return contribution: taxes, $(RRC_{tax,t})$	0.004*** (0.000)	0.006*** (0.004)	0.003*** (0.000)	0.004*** (0.000)
	0.010	0.006	0.008	0.011

Table 6.3: **Descriptive statistics:** Residual return contribution levels for each (sub-)sample and time period. First number for each residual return measure is the mean. Medians are presented within parentheses and the standard deviation is presented below. * statistically significant from 0 at the 10 % level, ** at the 5 % level and *** at the 1 % level.

	Sweden all companies	British all companies	Sweden sphere companies	Sweden pure companies
Panel B: Firm-year observations July 1981 - December 2004				
Residual return contribution from net asset value, $(RRC^{eat}_{nav,t})$	-0.062*** (-0.041)	0.009 (-0.001)	-0.053*** (-0.032)	-0.051** (-0.029)
	0.274	0.225	0.250	0.217
Residual return contribution: quoted securities, $(RRC_{nqs,t})$	-0.021* (-0.021)		-0.019 (-0.025)	-0.037** (-0.034)
	0.177		0.168	0.174
Residual return contribution: unquoted securities, $(RRC_{nus,t})$	-0.041*** (-0.005)		-0.034*** (-0.004)	-0.013 (0.002)
	0.194		0.169	0.104
Residual return contribution: administrative expenses, $(RRC_{adm,t})$	0.004*** (0.003)	0.010*** (0.008)	0.003*** (0.003)	0.003*** (0.002)
	0.004	0.010	0 003	0.004
Residual return contribution: taxes, $(RRC_{tax,t})$	0.006*** (0.001)	0.006*** (0.005)	0.004*** (0.000)	0.006*** (0.001)
	0.012	0.006	0.008	0.013

Table 6.3 cont. Descriptive statistics: Residual return contribution levels for each (sub-)sample and time period. First number for each residual return measure is the mean. Medians are presented within parentheses and the standard deviation is presented below. * statistically significant from 0 at the 10 % level, ** at the 5 % level and *** at the 1 % level.

The most divergent findings between the British and Swedish samples are found for administrative expenses. The British sample has administrative expenses that are 2.5 times the size of the administrative expenses for the Swedish sample. The result holds for the medians. Approximately 1 % of the British security portfolios are paid in administrative expenses each year. According to theory, the higher ratio for administrative expenses would imply a more negative premium but as has been seen above the opposite relationship holds for the premium. The significant differences between the

British and the Swedish data prevail despite the relatively low levels of significance for the residual returns for the Swedish data.

Tax expenses are very small, being between 0.3 to 0.6 % of the value of the total net operating assets. The medians are even smaller. The closed-end investment companies seem to manage their tax situation and minimize most effects of double or triple taxation. However, the operational effects of the tax management still remain to be analyzed.

The total expense level for an unlevered closed-end investment company differs substantially between the countries both in terms of means and medians. For a British closed-end investment company 1.0 % of the security portfolio is on average lost each year in expenses (median 0.8 %). The same figures for the Swedish companies are 0.4 % and 0.3 % respectively. The difference is 0.6 % and 0.5 % annually, which for the purpose of valuation is a substantial number.

6.2.3 Financing

The closed-end investment companies are mainly financed by equity even though they are allowed to take on debt. The Swedish companies have a mean leverage, measured as the debt-to-net asset value ratio, of about 10 % looking at the full sample. The leverage is somewhat higher for the period 1981-2004, 12.5 %. It should be noted that the standard deviation has also increased between the two sub-periods suggesting a more company specific leverage strategy and that the mix of companies for the latter period may have increased the mean. This is further corroborated by the observation that the median of the leverage is almost negligible. The British companies have only negligible levels of debt.

The mean level of interest expenses is a bit higher than expected, given that the mean riskfree interest rates have been approximately 8.7 % (Sweden) and 9.1 % (UK) for the 1972-2004 period and 9.2 % (Sweden) and 8.4 % (UK) for the 1981-2004 period[139]. The median levels look much more in line with the expectations. The high levels could be attributable to periods of high inflation with many observations. Furthermore, growth creates higher

[139] The official base interest rates from the Bank of England and Riksbanken have been used.

levels of interest rate when the measure of liabilities is taken from the beginning of the period.

	Sweden all companies	British all companies	Sweden sphere companies	Sweden pure companies
Panel A: Firm-year observations December 1972 - December 2004				
Interest, RNFL	0.152	0.113	0.117	0.104
Leverage, $\left(\frac{nfl_t}{nav_t}\right)$	0.106 (0.014)	0.037 (0.000)	0.094 (0.042)	0.096 (0.033)
	0.187	0.107	0.177	0.196
Panel B: Firm-year observations July 1981 - December 2004				
Interest, RNFL	0.124	0.117	0.136	0.108
Leverage, $\left(\frac{nfl_t}{nav_t}\right)$	0.124 (0.060)	0.042 (0.000)	0.118 (0.060)	0.125 (0.034)
	0.212	0.112	0.198	0.234

Table 6.4: **Descriptive statistics:** Interest expenses and leverage levels for each (sub-)sample and time period. First number for each residual return measure is the mean. Medians are presented within parentheses and the standard deviation is presented below.

6.2.4 Portfolio composition and ownership structure

Both portfolio composition and ownership structure reveal substantial differences between the British and Swedish samples and within the Swedish sample as can be seen in table 6.5. As expected, the British sample shows a significantly higher degree of diversification and significantly less investment in unquoted securities than the total Swedish sample does. Comparatively, only 16.5 % (median 13.5 %) of the total portfolio of quoted securities is concentrated to the three largest investments in the British companies. The corresponding levels for the Swedish companies are 48.3 % (44.8 %) for their Swedish counterparts.

The sphere sample was partially chosen in order to control for controlling power. However, no indication of a substantially higher portfolio concentration level than for the total sample can be found. Examining the sub-sample of pure Swedish companies brings no difference from the total Swedish sample. The concentration within the portfolio is high and it differs only marginally from the full sample.

	Sweden all companies	British all companies	Sweden sphere companies	Sweden pure companies
Panel A: Firm-year observations December 1972 - December 2004				
Unquoted securties	0.247 (0.191) 0.230	0.086 (0.016) 0.183	0.212 (0.148) 0.229	0.112 (0.077) 0.118
Portfolio concentration, (PCON)	0.478 (0.435) 0.235		0.492 (0.460) 0.228	0.473 (0.420) 0.244
Percentage of votes	0.366 (0.330) 0.184		0.367 (0.342) 0.183	0.302 (0.283) 0.154
Percentage of capital	0.292 (0.236) 0.162		0.295 (0.239) 0.162	0.278 (0.236) 0.155
Votes-to-capital (V/C)	1.348 (1.095) 0.597		1.303 (1.107) 0.429	1.124 (1.000) 0.237
Panel B: Firm-year observations July 1981 - December 2004				
Unquoted securties	0.240 (0.190) 0.227	0.091 (0.013) 0.193	0.193 (0.148) 0.202	0.108 (0.049) 0.126
Portfolio concentration (PCON)	0.483 (0.448) 0.236	0.165 (0.135) 0.123	0.498 (0.460) 0.228	0.478 (0.430) 0.248
Percentage of votes	0.378 (0.349) 0.179		0.381 (0.357) 0.178	0.318 (0.299) 0.150
Percentage of capital	0.300 (0.239) 0.161		0.306 (0.247) 0.160	0.292 (0.239) 0.153
Votes-to-capital (V/C)	1.362 (1.107) 0.608	1	1.317 (1.123) 0.436	1.129 (1.000) 0.244
Fund manager percentage (FM) 1999-2004		0.176 (0.142) 0.113		
Beneficial owner percentage (BO) 1999-2004		0.114 (0.097) 0.082		

Table 6.4: Descriptive statistics: Diversification and measures of formal power for each (sub-)sample and time period. First number for each residual return measure is the mean. Medians are presented within parentheses and the standard deviation is presented below.

Regarding unquoted securities as a fraction of total investments the British sample displays a highly skewed distribution. The mean is close to 10 % and the medians are 1.3 % and 1.6 % respectively for the two time periods. Those closed-end investment companies which display high levels of unquoted securities tend to be focused on investments in a single industry[140].

More heterogeneity can be found among the Swedish (sub-)samples. The all company sample has about one-fourth of the portfolio invested in unquoted securities, a ratio that hardly changes over time. The median is lower than the mean but much less so than for the British companies. The Swedish companies appear to follow a different strategy than the British companies.

The Swedish sub-sample of pure investment companies shows low levels of unquoted securities. The mean level of unquoted securities is 11.2 % and 10.8 % for the two time periods, and the median is slightly lower. These levels are close to the observations from the British sample. In contrast to the other Swedish (sub-)samples, the difference between the pure companies' level and the British companies' level is not statistically significant. The observation confirms the assumption that this sub-sample is more comparable to the British sample than the other parts of the Swedish sample. It is worth noting that the standard deviation for the pure companies is much lower than for any other Swedish (sub-)sample. In this respect the British sample is more similar to the all companies Swedish sample.

Substantial differences in ownership structure are found between the Swedish and British samples. The largest owners of the British companies have a much smaller proportion of the voting rights in the investment company than is the case for the Swedish ones[141]. The largest owner of the Swedish companies has more than twice as high percentage of votes as the largest owner for the British companies. The difference is statistically significant and the results are similar for both measure of ownership concentration for the British companies.

The Swedish companies may have different voting rights for different shares. Three measures of formal power are used in this study: the percentage of voting rights, the percentage of capital rights and the ratio

[140] Examples of this are the International Biotechnology Trust and the Radiotrust later called the Media Income trust.
[141] Recall that the ownership structure is measured as the percentage of votes and/or capital being controlled by the largest owner.

between the voting and capital shares for the shareholder with the largest percentage of voting rights. The percentage of voting rights differs between the (sub-)samples, ranging from 30.2 % (pure companies) to 38.1 % (sphere companies). No corresponding difference in the percentage of capital rights can be observed.

The implication is that the owners of the pure companies do not benefit as much from the dual class shares as the owners of other Swedish companies do. The votes-to-capital ratio is 1.124 (1.000) for the pure companies compared to 1.348 (1.095) for the full Swedish sample and 1.303 (1.107) for the sphere companies. The relationship between the all companies and the pure companies (sub-)samples implies a votes-to-capital ratio of 1.586 for non-pure Swedish companies, which must be considered high. The median of 1.000 for the pure ones indicates that most of the companies in this group do not use dual class shares.

6.2.5 Conclusions from descriptive statistics

The observations from the descriptive statistics discussed above may have a substantial impact on the analyses of correlations and regression results. The main observations are summarized in the bullet points below and brought forward as the basis for further analyses:

- Swedish companies have significantly more negative premiums than the British companies do.
- Residual return contributions from Swedish companies are significantly more negative than residual return contributions from the British companies between 1981 and 2004.
- Negative residual return contributions on Swedish companies stem mostly from negative residual returns on quoted securities rather than unquoted securities.
- Swedish companies have lower administrative expenses than the British companies have.
- The portfolios of quoted securities are more concentrated for Swedish companies than they are for British companies.
- Swedish companies invest more in unquoted securities than British companies do.

- Ownership concentration is much higher in Swedish companies than in British companies. Swedish companies use shares with different voting rights extensively.
- Pure Swedish companies resemble the British companies much more than other Swedish companies with respect to portfolio composition and ownership structure measured as votes-to-capital.

6.3 Bivariate linear relationships between variables - correlations

In this part of the chapter the relationships between the variables from chapters four and five are examined and presented. The focus here is on the relationship on a bivariate basis both with respect to connections between dependent and independent variables from the models and to connections between return measures from a time series perspective. The examination of the bivariate correlations is meant to give insights into how strong the connections are compared to the partial relationships examined in regression analyses and to detect any potential problem of multicollinearity. Complete correlation tables are found in appendices 6.4 and 6.5

6.3.1 Premiums and residual returns contributions

The correlations between premiums and measures of residual return contributions are shown in table 6.5. Generally, the correlations are low. All but one of them is below 0.27 and all but four of the portfolio related residual return correlations are below 0.1. The examination of the pure Swedish companies and the British companies reveals in most cases even lower correlations. For the Swedish pure companies only the contributions from administrative expenses and taxes show a correlation with premiums substantially above 0.1. The British sample shows the same pattern for the expense ratios, but contrary to the Swedish companies there is a high positive correlation on historic performance.

	Sweden all companies	British all companies	Sweden sphere companies	Sweden pure companies
Panel A: Residual return contributions from net asset value				
Residual return contribution: net asset value historic average, $\left(RRC^{eat}_{nav,hist}\right)$	-0.1079*	0.2299***	-0.1421**	-0.0245
Residual return contribution: net asset value in period 0, $\left(RRC^{eat}_{nav,0}\right)$	-0.0477	0.0732***	-0.1110*	-0.0681
Residual return contribution: net asset value in period 1, $\left(RRC^{eat}_{nav,1}\right)$	0.0868*	0.0071	0.0744	0.0089
Residual return contribution: net asset value in period 2, $\left(RRC^{eat}_{nav,2}\right)$	0.0600	-0.0279	-0.0443	-0.0769
Panel B: Residual return contributions from quoted securities				
Residual return contribution: quoted securities historic average, $\left(RRC_{nqs,hist}\right)$	0.0307		0.0389	0.0153
Residual return contribution: quoted securities in period 0, $\left(RRC_{nqs,0}\right)$	0.0262		0.0244	-0.0267
Residual return contribution: quoted securities in period 1, $\left(RRC_{nqs,1}\right)$	-0.0058		0.0303	0.0398
Residual return contribution: quoted securities in period 2, $\left(RRC_{nqs,2}\right)$	-0.0220		-0.0659	-0.0903
Panel C: Residual return contributions from unquoted securities				
Residual return contribution: unquoted securities historic average, $\left(RRC_{nus,hist}\right)$	-0.1609***		-0.2678***	-0.1345
Residual return contribution: unquoted securities in period 0, $\left(RRC_{nus,0}\right)$	-0.0674		-0.1814***	-0.0663
Residual return contribution: unquoted securities in period 1, $\left(RRC_{nus,1}\right)$	0.1468***		0.0880	0.0014
Residual return contribution: unquoted securities in period 2, $\left(RRC_{nus,2}\right)$	0.0979*		0.0075	0.0276
Panel D: Residual return contributions from administrative expenses and taxes				
Residual return contribution: administrative expenses in period 1, $\left(RRC_{adm,1}\right)$	0.1274***	0.1680***	0.1865***	0.2194**
Residual return contribution: taxes in period 1, $\left(RRC_{tax,1}\right)$	0.1230***	0.0896***	0.0591	0.1578**

Table 6.5: **Bivariate correlations:** Correlation between premiums and measures of residual return contributions for period 0, 1, 2 and an arithmetic average from -2 to 0 relative to the premium date 0. * statistically significant correlation at the 10 % level, ** at the 5 % level and *** at the 1 % level.

Looking at specific components of the residual return contributions some patterns emerge. The residual return contributions from net asset value and the quoted and unquoted portfolios for the Swedish sample reveal some informative patterns. The net asset value correlations, as displayed in panel A of table 6.5, are always very low and for most future looking measures close to zero. The full and the sphere Swedish samples show levels of about 0.08. The British sample and the Swedish pure companies sub-sample correlations are 0. The historic levels for net asset value indicate a different situation. The strength of the correlations is much higher than for the forward looking components. The correlation between premiums and past residual return contributions on net asset value varies between the samples and over time.

The sign of the correlations between historic residual return contribution on net asset value and premiums vary between the samples. The Swedish samples show negative correlations, while the British sample shows positive correlations. The strength of the significantly positive correlation for British companies is 0.23, which is substantially higher than the weakly significant level of -0.11 and -0.14 for the full and sphere Swedish samples. In the case of the pure Swedish companies the correlation is negligible.

One observation for later additional examination is made. The difference in correlations between the Swedish sub-samples and relative to the British sample indicates that there is an impact of the portfolio composition on the correlations between residual return contribution from net asset value and premiums. Panel B in table 6.5 displays the correlations between residual return contributions from quoted securities and premiums. The residual return contribution from quoted securities is very low and varies between 0.04 (historic average sphere sub-sample) to -0.09 (two periods after the premium date pure sub-sample) for the (sub-)samples.

Panel C in table 6.5 displays the correlations between residual return contributions from unquoted securities and premiums. The levels for the unquoted securities are stronger than for the residual return contributions from quoted securities and net asset value. This is particularly so for the near future and the past. The period immediately after the premium date shows a positive correlation of 0.15 for the all companies sample. This is the only significant correlation between premiums and future residual return contributions from unquoted securities. The past residual return contribution from unquoted securities shows stronger correlations than the forward looking measures. However, the correlations are in this case negative. The correlation is -0.16 for the all companies sample and -0.27 for the sphere sub-sample. Both correlations are highly significant, which is consistent with non-continuous conservatively measured investments. From these observations it appears that there is substantial additional knowledge to be gained from understanding the differences between the quoted and unquoted security portfolios of the closed-end investment companies.

The highest correlation is found between premiums and administrative expenses and the correlation is positive, which can be seen in panel D of table 6.5. For the Swedish sample the correlations range from 0.13 to 0.22. The correlation between premiums and taxes is significant for the Swedish all companies and pure (sub-)samples. The positive signs of the correlation contradict the theoretical prediction. The British sample also shows high and significantly positive correlations for the administrative expenses and taxes, 0.17 and 0.09 respectively.

6.3.2 Premiums and control and financing variables

The correlations between the portfolio and ownership concentration variables and premiums are even lower than for the residual return contributions for the full Swedish sample. This can be seen in panel A of table 6.6. The largest but only weakly significant correlation is -0.13 and it is found for the controlling power variable, i.e. the interaction between votes-to-capital and portfolio concentration. All the rest of the correlations are below 0.1 in absolute terms. The weakly significant negative correlation between premiums and controlling power is consistent with theory. The British sample shows equally weak results except for one variable, the beneficial owner percentage. The beneficial owner percentage shows a negative correlation with premiums of -0.21. This observation is the main argument for using M_3 as the measure for controlling power for the British sample.

These overall correlations seem to hide some stronger and contradictory patterns that exist in the sub-samples of the Swedish sample. The sphere sample exhibits similar correlations as the overall sample does, but they are generally stronger. The portfolio concentration variable shows a corrrelation of 0.24 compared to 0.07 found for the full data set. Most importantly, the correlation is highly significant. Similarly, the votes-to-capital variable has a significantly negative correlation of -0.21 compared to -0.09 for the full sample. In terms of the controlling power variable, no correlation is observed probably due to the different signs of the correlations for the included variables.

	Sweden all companies	British all companies	Sweden sphere companies	Sweden pure companies
Unquoted securties	-0.0572	-0.0689***	0.0661	0.0683
Portfolio concentration (PCON)	0.0693	-0.0283	0.2362***	0.2901***
Vote percentage	0.0129		0.0255	0.2296**
Capital percentage	0.0960*		0.1640**	0.2524***
Votes-to-capital (V/C)	-0.0921***		-0.2071***	-0.0418
Fund manager percentage (FM) 1999-2004		-0.0057		
Beneficial owner percentage (BO) 1999-2004		-0.2139***		
Votes-to-capital * portfolio concentration (M_1)	-0.1291*		0.0015	0.1396
Fund manager percentage * portfolio concentration (M_2)		-0.0699*		
Beneficial owner percentage * portfolio concentration (M_3)		-0.1825***		

Table 6.6: **Bivariate correlations:** Correlation between premiums and the control variables, portfolio concentration and measure of ownership concentration, and the proportion of unquoted securities. All correlations are based on variables measured at the same point in time. * statistically significant correlation at the 10 % level, ** at the 5 % level and *** at the 1 % level.

The findings from the pure Swedish company sample are somewhat different from the other Swedish (sub-)samples. The vote and capital percentage measures show strong and positive correlations with the premiums. As a result, the votes-to-capital shows an insignificant correlation. These correlations should be examined in the light of the descriptive statistics in table 6.4. The votes-to-capital ratio is much lower for this sub-sample than for the others with a median of 1.00. The somewhat higher mean was mainly driven by the company Svolder. Svolder has here been excluded from the sample due to its specific characteristics. The controlling power variable is insignificant, which is consistent with the low variation in the formal power variable, the votes-to-capital ratio.

6.3.3 Correlations between explanatory variables

Correlations between the explanatory variables are very low for both the Swedish and the British samples as can be seen from tables 6.7 through 6.9 and appendix 6.4. This indicates no severe problems of multicollinearity in the sample. The strongest correlations are observed for the variables which are expected to have a strong empirical relationship and consequently they are not meant to be included in the same regression models[142]. Still there are some relationships between explanatory variables that deserve to be commented on in order to understand the positions and cash flow streams of the companies.

As can be seen from table 6.7, the time series patterns of residual return contributions are weak. All correlations are smaller than +/-0.14. In the British case a negative correlation of -0.09 from period t to t+2 for net asset value residual return is the strongest and the only coefficient that is significant at the one percent level. The significance is due to the large number of observations used to determine the correlation. As a result, the persistence in performance is negligible for all (sub-)samples. From a company analysis perspective, this indicates that value affecting information related to residual returns seems to be short-term and occasion specific.

Administrative expenses should potentially be correlated with the amount of time, effort and skill required to manage the portfolio and maybe to the degree of success in doing so. Large ownership positions in portfolio companies might require such time and effort and could therefore generate higher administrative expenses. Moreover, large shareholders' potential possibility to reap personal economic benefits from the companies could also materialize in higher administration expenses. Correlations between administrative expenses and the control variables and unquoted securities are found in table 6.8. In the British sample strong correlations are found between portfolio composition and administrative expenses. The higher percentage of unquoted securities is, the higher the administrative expenses

[142] Examples of this is that the correlation between the residual return contribution from net asset value has a correlation coefficient with the residual return contribution for quoted securities in the same period of 0.80 and historic average residual return contribution from unquoted securities has a correlation of 0.55 with last periods residual return contribution from unquoted securities for the Swedish all companies sample.

are. A high positive correlation between administrative expenses and portfolio concentration is also observed. The correlations are 0.35 and 0.27 respectively and they are highly significant.

	Sweden all companies	British all companies	Sweden sphere companies	Sweden pure companies
Panel A: Residual return contributions from net asset value				
Residual return contribution: net asset value in period 1, $\left(RRC_{nav,1}^{eat}\right)$	0.0630	-0.0010	0.0554	0.0446
Residual return contribution: net asset value in period 2, $\left(RRC_{nav,2}^{eat}\right)$	-0.1177**	-0.0929***	-0.0392	-0.0397
Panel B: Residual return contributions from quoted securities				
Residual return contribution: quoted securities in period 1, $\left(RRC_{nqs,1}\right)$	0.0036		0.0259	0.0266
Residual return contribution: quoted securities in period 2, $\left(RRC_{nqs,2}\right)$	-0.1042*		-0.0494	-0.0084
Panel C: Residual return contributions from unquoted securities				
Residual return contribution: unquoted securities in period 1, $\left(RRC_{nus,1}\right)$	0.1022*		0.0894	-0.0781
Residual return contribution: unquoted securities in period 2, $\left(RRC_{nus,2}\right)$	-0.1052*		0.0421	-0.1378*

Table 6.7: Bivariate correlations: Time series correlations between residual return contributions at time 0 and the subsequent periods, 1 and 2. * statistically significant correlation at the 10 % level, ** at the 5 % level and *** at the 1 % level.

Similar findings for unquoted securities are observed for the full Swedish sample and the sphere sample with highly significant correlations of 0.14 and 0.22 respectively. Contrary to the British case no material correlations are found between portfolio concentration and administrative expenses for the full and sphere Swedish (sub-)samples. The pure Swedish sub-sample shows a strong negative correlation between portfolio concentration and administrative expenses. The explanations for this observation are further discussed and analyzed in chapter eight.

In the British case ownership concentration variables have very low effects on administrative expenses. The high correlations between administrative expenses and the controlling power variables, M_2 and M_3, are entirely driven by the portfolio concentration component. This is contradictory to the Swedish case where the correlations are mostly driven by the ownership concentration variable. The votes-to-capital ratio is significantly positively correlated with admininstrative expenses. The correlation varies between 0.24 and 0.48 for the various sub-samples. The strongest correlation is found in the sphere sample. The other measures of ownership concentration are hardly significant.

	Sweden all companies	British all companies	Sweden sphere companies	Sweden pure companies
Unquoted securties	0.1996***	0.3472***	0.1969***	0.0874
Portfolio concentration (PCON)	-0.0373	0.2749***	0.0000	-0.1412**
Vote percentage	0.0738		0.2067***	0.0508
Capital percentage	-0.1362*		-0.1280*	-0.1640*
Votes-to-capital (V/C)	0.2383***		0.4698***	0.2590***
Fund manager percentage (FM) 1999-2004		0.0494		
Beneficial owner percentage (BO) 1999-2004		0.0901*		
Votes-to-capital * portfolio concentration (M_1)	0.1709**		0.3279***	-0.0026
Fund manager percentage * portfolio concentration (M_2)		0.2720***		
Beneficial owner percentage * portfolio concentration (M_3)		0.2451***		

Table 6.8: Bivariate correlations: Correlation between residual return contributions from administrative expenses in period t+1 and the control variables, portfolio concentration and measure of ownership concentration, and the proportion of unquoted securities. * statistically significant correlation at the 10 % level, ** at the 5 % level and *** at the 1 % level.

The variables that are aimed at measuring controlling power, M_1, M_2 and M_3, show very different patterns for the relative influence of the two components, formal power (ownership) and portfolio concentration. This can be seen in table 6.9. In the case of the British sample and the Swedish full sample the correlation between the components of the M variables and M is approximately equally large. This means that about equally much of the variation in M can be explained by its two components.
The pure Swedish sub-sample shows very different relations. The impact from the votes-to-capital ratio is much smaller than for any of the other samples or sub-samples, 0.42. The impact of portfolio concentration is

almost twice as high, 0.83, meaning that most of the variation in M is driven by changes in portfolio composition.

The sphere sample shows characteristics that are in between the findings from the two Swedish (sub-)samples. The impact from portfolio concentration is consistently strong but in this case votes-to-capital also shows a strong correlation with M_1. The correlation between the votes-to-capital ratio and M_1 is 0.50.

	Sweden all companies	British all companies	Sweden sphere companies	Sweden pure companies
Panel A: Correlations with measures of controlling power (M)				
Portfolio concentration (PCON) with M_1	0.5881***		0.7525***	0.8286***
Portfolio concentration (PCON) with M_2		0.7117***		
Portfolio concentration (PCON) with M_3		0.7747***		
Votes-to-capital ratio (V/C)	0.7087***		0.5050***	0.4190
Fund manager percentage (FM)		0.6333***		
Beneficial owner percentage (BO)		0.6791***		
Panel B: Correlations with portfolio concentration (PCON)				
Vote percentage	0.4574***		0.5029***	0.6028***
Capital percentage	0.5396***		0.5988***	0.6514***
Votes-to-capital ratio (V/C)	-0.0255		-0.1185	-0.1267
Fund manager percentage (FM)		0.0594		
Beneficial owner percentage (BO)		0.2908***		

Table 6.9: Bivariate correlations: Correlation between the measures of controlling power and the components of the measures, portfolio and ownership concentration. M_1 is PCON*V/C, M_2 is PCON*FM and M_3 is PCON*BO.* statistically significant correlation at the 10 % level, ** at the 5 % level and *** at the 1 % level.

The correlations between the measures of ownership concentration and portfolio concentration used for the measure of controlling power are generally small and insignificant. The only exception is identified for the relationship between beneficial owner percentage and the portfolio concentration for the British sample. This correlation is 0.29 and highly significant. Consequently, it appears that the components of the M variables are very independent from each other, indicating that all combinations of the components reasonably occur. Moreover, it is not predetermined that, because a certain ownership structure is observed, a certain level of portfolio concentration is also expected. From an interpretation point of view, those firm-years that show high scores for M are most likely there due to a deliberate choice rather than due to a convention, which increases the strength of the possible conclusions from the regressions with respect to premium levels. However, it is worth noting that both the votes and capital percentages for the Swedish companies are strongly correlated with portfolio concentration. This indicates that pure formal power affects the focus of the portfolio investments.

No substantial correlations can be found between the financing variables and any of the return or ownership related variables, see appendix 6.4. The lack of correlation between leverage and ownership structure could suggest that the power based arguments are even stronger since agency theory proposes that debt financing can be used as a way to alleviate agency problems.

6.3.4 Conclusions from correlations

The main conclusions from the correlations can be summarized as follows

- Most residual return components show weak correlations with premiums.
- Average past performance is most strongly correlated with premiums.
- Past performance on quoted securities shows a positive correlation with premiums and past performance on unquoted securities shows a negative correlation with premiums.
- No time series correlations (performance persistence) can be found in any sample.
- Administrative expenses are significantly positively correlated with premiums and positively correlated with the votes-to-capital ratio and percentage of unquoted securities.
- The components of controlling power, M, are consistently strongly correlated with the portfolio concentration component for the Swedish sample. The correlation with formal power, the votes-to-capital ratio, is dependent on the sub-sample.
- The British sample shows a stronger correlation between controlling power and formal power than between controlling power and portfolio concentration.

- There are low levels of correlation between portfolio concentration and the main ownership concentration variables.

6.4 Regression results

The bivariate correlations presented above indicated low to moderately strong correlations between premiums and suggested explanatory variables. The effect of the analyses of correlations is that only the one-period ahead realized residual return contributions are used combined with measures of historic residual return contributions. Equations 5.1 through 5.4 are modified accordingly and the actual regression estimated are presented in equations 6.1 through 6.4.

$$\begin{aligned}\text{Premium}_0 = {} & \alpha + \beta_{nav,1}\text{RRC}^{\text{eat}}_{\text{nav,1}} + \beta_{nav,histl}\text{RRC}^{\text{eat}}_{\text{nav,hist}} + \beta_{nav,histc}\left(\text{RRC}^{\text{eat}}_{\text{hist,t}}\right)^3 + \\ & + \beta_{adm,1}\text{RRC}_{\text{adm,1}} + \beta_{tax,1}\text{RRC}_{\text{tax,1}} + \varepsilon\end{aligned} \tag{6.1}$$

$$\begin{aligned}\text{Premium}_0 = {} & \alpha + \beta_{nus,1}\text{RRC}_{\text{nus,1}} + \beta_{nus,hist}\text{RRC}_{\text{nus,hist}} + \beta_{nus,histc}\left(\text{RRC}_{\text{nus,hist}}\right)^3 + \\ & + \beta_{nqs,hist}\text{RRC}_{\text{nqs,hist}} + \beta_{adm,1}\text{RRC}_{\text{adm,1}} + \beta_{tax,1}\text{RRC}_{\text{tax,1}} + \varepsilon\end{aligned} \tag{6.2}$$

$$\begin{aligned}\text{Premium}_0 = {} & \alpha + \beta_{nav,1}\text{RRC}^{\text{eat}}_{\text{nav,1}} + \beta_{nav,histl}\text{RRC}^{\text{eat}}_{\text{nav,hist}} + \beta_{nav,histc}\left(\text{RRC}^{\text{eat}}_{\text{hist,t}}\right)^3 + \\ & + \beta_{adm,1}\text{RRC}_{\text{adm,1}} + \beta_{tax,1}\text{RRC}_{\text{tax,1}} + \beta_{PCON}\text{PCON}_0 + \\ & + \beta_{PCONDum}\text{PCON}_0 \times \text{Dum} + \beta_M \text{M}_0 + \varepsilon\end{aligned} \tag{6.3}$$

$$\begin{aligned}\text{Premium}_0 = {} & \alpha + \beta_{nus,1}\text{RRC}_{\text{nus,1}} + \beta_{nus,hist}\text{RRC}_{\text{nus,hist}} + \beta_{nus,histc}\left(\text{RRC}_{\text{nus,hist}}\right)^3 + \\ & + \beta_{nqs,hist}\text{RRC}_{\text{nqs,hist}} + \beta_{adm,1}\text{RRC}_{\text{adm,1}} + \beta_{tax,1}\text{RRC}_{\text{tax,1}} + \\ & + \beta_{PCON}\text{PCON}_0 + \beta_{PCONDum}\text{PCON}_0 \times \text{Dum} + \beta_M \text{M}_0 + \varepsilon\end{aligned} \tag{6.4}$$

where
Dum = 1 if the observation is prior to 1981 and 0 otherwise[143]

The regression model results presented below show the full model explanatory power and partial relationships between premiums and the

[143] Note that when the regressions are run for the 1981 – 2004 the PCON× Dum variable is excluded.

explanatory variables for all samples and partitions thereof except for model 6.1 amd 6.2 for the 1972-2004 regressions. The overall results are compelling in the sense that they indicate strong combined relationship between the explanatory variables and premiums in line with the hypotheses. Explanatory power measured as adjusted R-squares vary from 6.8 % in the most aggregated and parsimonious models to 45.6 % in the most detailed specifications. Strong indications of a parametric shift can be found for the Swedish sample in the early 1980s. The shift has been operationalized to occur in 1981 in line with the discussion in chapter five[144]. Moreover, the contributions from the control variables, i.e portfolio concentration (PCON) and controlling power (M), are substantial in almost all cases. They increase explanatory power by 12 to 31 percentage points.

Tables of the complete regression results are provided in appendix 6.6 for market adjusted residual return contribution measures. Appendices 6.7 and 6.8 provides the regression results using beta adjusted residual return contributions and fixed effects regressions respectively[145]. In appendix 6.9, the results are presented from the regressions using only observations where the control variables are observable but not included in the model. Appendix 6.10 provides results from regressions when time dummies are included in the regressions.

From an estimation perspective, it should be noted that all models include only linear relationships between the dependent and independent variables. However, the historic residual return contributions from net asset value and unquoted securities are included in a cubic form. The introduction of the control variables limit the number of observations included in the regression substantially. Regressions have been run for matched samples but without the controls. The general effects from including the control variables are strongly dependent on the sub-sample investigated.

All regressions are based on pooled data for each sample and sub-sample. The difference in sample size between the Swedish and the British samples has strong implications for the standard errors of the coefficient estimates. The large size of the British sample makes the significance level high but

[144] Other time periods have been tested for the appropriate shift with less strong results.

[145] The fixed effect regressions have been run to control for identified serial correlation between the residuals for each company. No serial correlations remain thereafter. The impact on the estimated coefficients is small.

difficult to interpret from an economic perspective. The effect on premiums from the explanatory variables given the estimated coefficient levels combined with adjusted R-squares could be seen as more relevant measures of the practical implications of the evaluated models.

As in sections 6.2 and 6.3, tables showing empirical findings for the specific issue discussed are continuously provided.

6.4.1 The net asset value based regressions

The net asset value based regressions are consistently estimated with respect to the residual return contribution measures for the British and the Swedish samples. This enables a direct comparison between the regressions for the two countries. Still there remains a difference in the estimation of M, which has to be taken into consideration when evaluating the results.

6.4.1.1 Explanatory power

As shown in table 6.10, the explanatory power of the models excluding the control variables is generally low. The R-squares are very similar between the samples, particularly for the British and Swedish full samples and the pure Swedish companies when no control variables are included. Two issues are of particular interest. First, there are the consistently low levels of explanatory power for the British sample. Second there is the sharp increase in the explanatory power for the Swedish sample from the 1972-2004 partition to the 1981-2004 partition. The first observation indicates that explanations may be found in the differences in the structure of the companies between the geographical markets. The second observation indicates that changes in the financial markets over time may be an explanation for the Swedish observations.

	Sweden all companies	British all companies	Sweden sphere companies	Sweden pure companies
Panel A: Regression models without the control variables				
1973 – 2004 (eq. 6.1, p.164)	0.068	0.093	0.115	0.064
1981 – 2004 (eq. 6.1, p.164)	0.138	0.073	0.170	0.109
Panel B: Regression models with the control variables				
1973 – 2004 (eq. 6.3, p.164)	0.239		0.362	0.387
1981 – 2004 (eq. 6.3, p.164)	0.255	0.117	0.379	0.383

Table 6.10: Explanatory power: Adjusted R-squares for the regression models for all samples and sub-samples, time periods and with and without control. Residual returns on net asset value are used. Residual returns are measured using market adjusted residual returns.

When the control variables are added to the regression models, the explanatory power increases substantially for all (sub-)samples. This is particularly so for the Swedish (sub-)samples. This increase in R-square is due to two different forces, namely the change in samples and the inclusion of the control variables. In order to separate the two effects, regressions have been run for the same samples with and without the control variables. A summary of the R-squares and relative effect of the change in sample due to control variables is presented in table 6.11.

	Sweden all companies	British all companies	Sweden sphere companies	Sweden pure companies
1973-2004 (eq. 6.1, p.164)	0.179 (64.9 %)		0.198 (33.6 %)	0.163 (30.6 %)
1981-2004 (eq. 6.1, p.164)	0.203 (55.6 %)	0.089 (21.9 %)	0.230 (28.7 %)	0.200 (34.6 %)

Table 6.11: Adjusted R-squares for matched regressions using residual return contributions from net asset value: The proportions of the change in the R-square due to the sample change relative to the unmatched regressions are presented in parentheses.

The effect on the explanatory power differs considerably between the (sub-)samples. In order to understand the different effects, it is important to recognize that it is the oldest observations that disappear when the control variables enter the model. In the Swedish sample mostly observations from the 1970s disappear. In the British sample all remaining observations are from after mid-1998.

In the case of the full Swedish sample about two-thirds of the change is explained by the sample change and one-third by the inclusion of the control variables, whereas for the sphere and the pure samples the proportions are reversed. The size of the improvement in explanatory power for the Swedish sample is not present for the British sample. The British sample shows an increase in explanatory power by 1.6 percentage points. For the British sample, the residual return contributions explain approximately equally much independently of the sample. This should be compared to an increase of 10 – 20 percentage points for the Swedish (sub-)sample.

The Swedish pure companies are somewhat different from the other Swedish (sub-)samples. The added explanatory power from changing the sample is greater for the 1981-2004 period than for the full period. This suggests that the observations for the 1970s are not as different from later observations for the pure companies as they are for the other samples.

6.4.1.2 Coefficient estimates – residual return contributions

Coefficient estimates for the residual return contributions are shown in table 6.12. The signs of the coefficient estimates are mostly consistent within the samples over time and between the samples for both time periods. The coefficient on the future residual return variable is consistently positive for the Swedish sample and marginally negative for the British sample. The significance level is very low for almost all of the Swedish (sub-)samples. The full sample shows a significant coefficient when the control variables are included in the model, and it is particularly strong for the 1981-2004 time period. The negative coefficient for the British sample is significant at least at the five percent level for both time periods. These results are generally inconsistent with the proposed relationship.

The historic residual return components, linear and non-linear, are strongly significant for the 1981-2004 period and when the control variables are included for the full period. For the full Swedish, British and Swedish sphere (sub-)samples, the sign of the coefficient estimates are positive for the linear variable and negative for the cubed variable. The negative coefficient is much larger than the linear coefficient for the Swedish sample, while the

British sample shows coefficients of approximately similar size. There appears to be a positive relationship between premiums and historic residual returns within an interval relatively close to zero for the Swedish companies. This relationship turns negative in the tails of the residual return distributions. In the British case, the positive relationship remains for all relevant levels of residual returns. No significant estimates are found for the pure Swedish companies The findings are compatible with the expectations, but less strong than expected.

	Sweden all companies	British all companies	Sweden sphere companies	Sweden pure companies
Panel A: Residual return contributions from net asset value in period 1, $\left(RRC_{nav,1}^{eal}\right)$				
1981 – 2004 (eq. 6.1, p.164)	0.120**	-0.032***	0.068	0.068
1973 – 2004 (eq. 6.3, p.164)	0.128**		0.049	0.026
1981 – 2004 (eq. 6.3, p.164)	0.143***	-0.052***	0.064	0.014
Panel B: Residual return contributions from net asset value historic average, linear $\left(\mathrm{RRC}_{\mathrm{nqs,hist}}\right)$				
1981 – 2004 (eq. 6.1, p.164)	0.670***	0.232***	0.470***	0.022
1973 – 2004 (eq. 6.3, p.164)	0.610***		0.492***	0.117
1981 – 2004 (eq. 6.3, p.164)	0.636***	0.219***	0.522***	0.143
Panel C: Residual return contributions from net asset value historic average, cubic $\left(\mathrm{RRC}_{\mathrm{nqs,hist}}\right)^3$				
1981 – 2004 (eq. 6.1, p.164)	-6.197***	-0.209***	-5.602**	2.138
1973 – 2004 (eq. 6.3, p.164)	-5.174**		-4.534*	1.297
1981 – 2004 (eq. 6.3, p.164)	-5.325**	-0.176***	-4.745**	1.094
Panel D: Residual return contributions from administrative expenses in period 1, $\left(\mathrm{RRC}_{\mathrm{adm,1}}\right)$				
1981 – 2004 (eq. 6.1, p.164)	3.364	1.570***	3.380	8.060***
1973 – 2004 (eq. 6.3, p.164)	9.469***		16.832***	10.032***
1981 – 2004 (eq. 6.3, p.164)	9.300***	0.965	15.759**	9.931***
Panel E: Residual return contributions from taxes in period 1, $\left(\mathrm{RRC}_{\mathrm{tax,1}}\right)$				
1981 – 2004 (eq. 6.1, p.164)	2.338**	-0.734*	0.294	0.570
1973 – 2004 (eq. 6.3, p.164)	0.533		-1.317	-2.061*
1981 – 2004 (eq. 6.3, p.164)	0.495	2.554***	-1.477	-2.058*

Table 6.12: Coefficient estimates on the residual return contributions for net asset value based regressions: Residual returns are measured using market adjusted residual returns. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

The coefficient on taxes is highly inconsistent both within and between samples. Expected negative coefficients that are significant are only identified for the British sample without controls and for the Swedish pure companies sample with controls for both time periods. In all cases the coefficients are only significant at the ten percent level. For the British sample the coefficient turns positive and highly significant when the control variables are added to the model. A positive and significant coefficient is also found for the Swedish all companies sample without controls. No theoretical explanations can be found for the latter two observations.

6.4.1.3 Coefficient estimates – diversification and controlling power

The coefficient estimates for portfolio concentration and controlling power are generally strong and consistent, which can be seen in table 6.13. For the Swedish (sub-)samples, the coefficients on the portfolio concentration variable are strongly positive. The diversification effect during the 1970s is strongly negative. The coefficient on the dummy variable has about the same magnitude as the coefficient on the portfolio concentration variable for the full and pure samples. In the case of the sphere sub-sample, the coefficient on the dummy variable is about half the size of the coefficient for the portfolio concentration variable. All coefficients are highly significant.

The evidence suggests that there exists no relationship between the portfolio concentration variable and premiums for the 1970s, but it turns strongly positive for the more recent period. The portfolio concentration variable is positive for the British sample as well, but it is not significant. It is important to keep in mind the very low average levels and standard deviations of portfolio concentration in the British sample before any conclusions can be drawn from the lack of significance.

The coefficients on the variables for controlling power, M, are significant at the one percent level for the full British and Swedish samples and for the Swedish sphere sub-sample for all time periods. The coefficient for the British sample is more negative than for the Swedish samples indicating a stronger reaction to controlling power than in the Swedish sample. Once again the lower levels of the British variables induced by the different structure of the ownership variable and lower standard deviation have direct effects on the estimation of the coefficients. In effect, a small change in the variables as measured for the Swedish company has a stronger effect on premiums based on the mean levels of ownership and portfolio concentration. The pure Swedish company sample differs from the rest of the samples with insignificant coefficient estimates.

	Sweden all companies	British all companies	Sweden sphere companies	Sweden pure companies
Panel A: Portfolio concentration (PCON)				
1973 – 2004 (eq. 6.3, p.164)	0.209**	N/A	0.471***	0.291**
1981 – 2004 (eq. 6.3, p.164)	0.218**	0.083	0.465***	0.282***
Panel B: Portfolio concentration (PCON) * year dummy				
1973 – 2004 (eq. 6.3, p.164)	-0.238***	N/A	-0.222***	-0.226***
1981 – 2004 (eq. 6.3, p.164)	N/A	N/A	N/A	N/A
Panel C: Votes-to-capital * portfolio concentration (M_1)				
1973 – 2004 (eq. 6.3, p.164)	-0.124**	N/A	-0.343***	-0.119
1981 – 2004 (eq. 6.3, p.164)	-0.122**	N/A	-0.326***	-0.097
Panel D: Beneficial owner percentage * portfolio concentration (M_3)				
1973 – 2004 (eq. 6.3, p.164)	N/A	N/A	N/A	N/A
1981 – 2004 (eq. 6.3, p.164)	N/A	-0.818***	N/A	N/A

Table 6.13: Coefficient estimates on the control variables – portfolio concentration and controlling power: Regressions include residual return contributions from net asset value. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

6.4.2 The security portfolio based regressions

Recall that the sub-portfolio based regressions are run only for the Swedish sample due to the lack of detailed data for the British companies. The aim of these regressions is to control for differences in the market perceptions and valuation approaches to quoted and unquoted securities respectively. As a result of the theoretical arguments and the correlations presented in section 6.3.1, future residual returns contributions and non-linear relationships for past residual returns between quoted securities and premiums have been omitted. The regressions are built on four residual return contribution components for the sub-portfolios. These are next period residual return contribution from unquoted securities, past average residual return contribution from unquoted securities both in a linear and cubic form and past average residual return contribution from quoted securities. The remaining parts of the regressions are identical to the ones for the net asset value based regressions.

6.4.2.1 Explanatory power

The explanatory power of the detailed models would in expectation be at least as high as the explanatory power for the net asset value based regressions. This is so since the return measures are divided into parts, which allows for different effects on premium from the information from each of the two portfolios. This is so even though the aggregated information and the control variables are the same. The only reason for finding a lower explanatory power in these models as compared to the ones presented in 6.4.1 is if the excluded versions of the return measures have substantial explanatory power[146]. Table 6.14 shows the explanatory power for the regressions using security based residual return contributions.

The full and sphere (sub-)samples show increased explanatory power, while the pure closed-end investment company sample shows almost unchanged R-squares. The negative impact for the pure companies is driven by the exclusion of the cubic form of the historic residual return for quoted securities.

	Sweden all companies	Sweden sphere companies	Sweden pure companies
Panel A: Regression models without the control variables			
1973 – 2004 (eq. 6.2, p.164)	0.094	0.173	0.003
1981 – 2004 (eq. 6.2, p.164)	0.158	0.222	0.090
Panel B: Regression models with the control variables			
1973 – 2004 (eq. 6.4, p.164)	0.309	0.424	0.386
1981 – 2004 (eq. 6.4, p.164)	0.342	0.456	0.386

Table 6.14: Explanatory power: Adjusted R-squares for the regression models for all samples and sub-samples, time periods and with and without control. Residual returns are measured using market adjusted residual returns.

[146] Recall that these are non-linear version of historic residual return contribution on quoted securities and the future residual return contribution from quoted securities.

The increase for the other full and sphere (sub-)samples is consistent over time. For the period 1981-2004 the R-squares reach 15.8 and 22.2 % respectively for the full and sphere (sub-)samples. This is an improvement with 2.0 and 5.2 percentage points respectively relative to the net asset value based regressions. Generally, the marginal impact of splitting the return measures is stronger when the control variables are added to the model. The increases in R-squares when the controls are included in the model are 7.0 to 8.7 percentage points for full sample. For the sphere sample the increase in R-squares is 6.2 and 7.7 percentage points respectively.

As for the net asset value based regressions, supplementary regressions have been run to determine the proportional effect of changing sample and including control variables for the security portfolio based regressions. The pattern is similar to the net asset value based regressions. The effect from changing samples is largest for the all companies sample. About two-thirds of the change in R-squares is due to the change in samples in that case. The two sub-samples show an impact from changing samples of slightly more than one-third of the total changes in R-squares as can be seen from table 6.15.

	Sweden all companies	Sweden sphere companies	Sweden pure companies
1973-2004 (eq. 6.2, p.164)	0.239 (67.4 %)	0.264 (45.0 %)	0.138 (35.2 %)
1981-2004 (eq. 6.2, p.164)	0.276 (64.1 %)	0.305 (35.5 %)	0.195 (35.5 %)

Table 6.15: Adjusted R-squares for matched regressions using residual return contributions from the sub-portfolios: The proportions of the change in the R-square due to the sample change relative to the unmatched regressions are presented in parentheses.

The explanatory powers for the 1981-2004 period with portfolio based residual return contribution measures and control variables reach 34.2 %, 45.6 % and 38.6 % for the all, sphere and pure companies samples respectively. It should be noted that the non-negligible R-squares is only a measure of how much of the cross-sectional and time-series variation in premium that can be explained by the model. A substantial intercept is still present, which from the point of understanding the cause of the premiums is discouraging.

6.4.2.2 Coefficient estimates – residual return contributions

There is a strong consistency in the sign of the parameter estimates for the sub-portfolio based residual return contributions as can be seen in table 6.16. The only exceptions relate to the residual return contribution from unquoted securities for the pure companies. The low proportion of unquoted securities and as a result thereof the insignificance of these estimates for this sample limits the concern generated by these findings.

The strength of the coefficient estimate for future residual return contribution from unquoted securities is dependent on the company characteristics, see panel A in table 6.16. The full sample generates a positive and significant coefficient at the five percent level or better for all regressions. This stability is unmatched by any other sample. The sphere sub-sample shows positive coefficients. The regressions including the control variables show that this coefficient is significant using a more complete model specification. Most importantly, for the 1981-2004 period with controls the coefficient is significant at the five percent level.

Regarding the historic residual return contribution from both quoted and unquoted securities, the sign and levels of the coefficients are very stable, as can be seen from table 6.16. The coefficient on the cubic unquoted residual return contribution is negative for all (sub-)samples and highly significant for the all and sphere companies samples, see panel D. Meanwhile the coefficient on the linear unquoted residual return contribution is positive and almost equally significant as the coefficient on the cubic measure, see panel C. The coefficient on the residual return contribution from quoted securities is strongly significant and positive for almost all (sub-)samples, see panel B. All of the coefficients are consistent with the theoretical predictions.

The conclusion for the unquoted securities is that a positive relationship between premiums and the residual return contributions is present in the area close to zero and a negative relationship in the tail of the distribution. This is so since the positive impact of the coefficient on the linear variable dominates in the area close to zero and the negative coefficient on the cubic variable dominates in area further away from zero. This is the same conclusion as for the net asset value regression. The additional insight obtained is that the relationship seems to be most importantly driven by the residual return contributions from unquoted securities. Moreover, the coefficient estimates are much larger for the unquoted contribution than for the net asset value residual returns, indicating a stronger marginal impact for the unquoted securities than for the net asset value measures. This change is due to the additional noise added by the residual return contributions from quoted securities in the net asset value measure. It should be noted that positive residual return contributions with a negative impact on premiums do not exist in the sample.

	Sweden all companies	Sweden sphere companies	Sweden pure companies
Panel A: Residual return contributions from unquoted securities in period 1, $(RRC_{nus,1})$			
1981 – 2004 (eq. 6.2, p.164)	0.182**	0.122	-0.047
1973 – 2004 (eq. 6.4, p.164)	0.245***	0.138*	-0.022
1981 – 2004 (eq. 6.4, p.164)	0.287***	0.185**	-0.046
Panel B: Residual return contributions from quoted securities historic average, linear $(RRC_{nqs,hist})$			
1981 – 2004 (eq. 6.2, p.164)	0.398**	0.261***	0.183*
1973 – 2004 (eq. 6.4, p.164)	0.205**	0.232**	0.227**
1981 – 2004 (eq. 6.4, p.164)	0.206**	0.217**	0.234**
Panel C: Residual return contributions from unquoted securities historic average, linear $(RRC_{nus,hist})$			
1981 – 2004 (eq. 6.2, p.164)	0.643***	0.380	0.307
1973 – 2004 (eq. 6.4, p.164)	0.777***	0.543**	0.306
1981 – 2004 (eq. 6.4, p.164)	0.822***	0.618**	0.378
Panel D: Residual return contributions from unquoted securities historic average, cubic $(RRC_{nus,hist})^3$			
1981 – 2004 (eq. 6.2, p.164)	-8.445***	-8.004***	-10.700
1973 – 2004 (eq. 6.4, p.164)	-8.561***	-7.245**	-8.484
1981 – 2004 (eq. 6.4, p.164)	-8.855***	-7.779***	-9.670
Panel E: Residual return contributions from administrative expenses in period 1, $(RRC_{adm,1})$			
1981 – 2004 (eq. 6.2, p.164)	2.777	3.228	6.944***
1973 – 2004 (eq. 6.4, p.164)	8.803***	15.478**	9.617***
1981 – 2004 (eq. 6.4, p.164)	8.614***	13.976**	9.619***
Panel F: Residual return contributions from taxes in period 1, $(RRC_{tax,1})$			
1981 – 2004 (eq. 6.2, p.164)	2.090*	-0.092	0.592
1973 – 2004 (eq. 6.4, p.164)	0.602	-1.375	-1.745
1981 – 2004 (eq. 6.4, p.164)	0.576	-1.600	-1.740

Table 6.16: Coefficient estimates on the residual return contributions for the sub-portfolio based regressions: Residual returns are measured using market adjusted residual returns. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level White standard errors.

The two expense ratios, administrative expenses and taxes, do once again show very different behaviors. The tax coefficient is highly unstable both with respect to sign and significance levels, as can be seen from panel F in table 6.16. Statistical significance is only obtained for the all companies sample when the control variables are excluded. Moreover, the sign of that coefficient is contradictory to the theoretical expectations. Consequently, no significant influence from taxes on premiums can be detected.

The stability of the coefficient estimates on administrative expenses is persuasive, see panel E in table 6.16. All coefficient estimates are positive and they are significant when the control variables are included. However, the size of the coefficient varies from 2.777 to 15.478. The unexpected sign of the coefficient even when portfolio residual returns have been controlled for is cumbersome. Moreover the increase in the magnitude of the coefficients when the control variables are included in the model indicates that there is a strong relationship between the control variables and administrative expenses. Such a relationship has been indicated by the bivariate correlation coefficients in section 6.3.3.

6.4.2.3 Coefficient estimates – diversification and controlling power

The control variable estimates are strong and almost identical to the ones observed for the net asset value based regressions, as can be seen in tables 6.17 and 6.13. The strongly positive coefficient on portfolio concentration and the strongly negative coefficients on the controlling power variable are robust and highly significant. Consequently, any changes recorded between the regressions based on security portfolio instead of net asset values are due to changes in the return measures and not in the marginal contribution provided by the control variables.

	Sweden all companies	Sweden sphere companies	Sweden pure companies
Panel A: Portfolio concentration (PCON)			
1973 – 2004 (eq 6.4, p.164)	0.241***	0.473***	0.326***
1981 – 2004 (eq 6.4, p.164)	0.257***	0.470***	0.318***
Panel B: Portfolio concentration (PCON) * year dummy			
1973 – 2004 (eq 6.4, p.164)	-0.236***	-0.210***	-0.237***
1981 – 2004 (eq 6.4, p.164)	N/A	N/A	N/A
Panel C: Votes-to-capital * portfolio concentration (M_1)			
1973 – 2004 (eq 6.4, p.164)	-0.127***	-0.324***	-0.157*
1981 – 2004 (eq 6.4, p.164)	-0.125***	-0.302***	-0.139

Table 6.17: Coefficient estimates on the control variables – portfolio concentration and controlling power: Regressions include residual return contributions from the sub-portfolios. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

6.4.3 Summary of regression results

As the basis for the forthcoming analyses in chapters seven and eight the following conclusions can be drawn from the regression models:

- Residual return contributions both measured as net asset value returns and security portfolio returns have explanatory power. This is particularly so for the historic residual return contributions.
- The explanatory powers of the model for Swedish pure closed-end investment companies and British closed-end investment companies are very similar.
- The coefficient estimates on residual returns for Swedish pure closed-end investment companies and British closed-end investment companies differ, but both are either insignificant and/or close to zero.
- The explanatory power of the model is enhanced by separating quoted and unquoted securities.
- Any relationship between future residual return contribution and premiums are through unquoted securities.

- Taxes show no relationship with premiums.
- Administrative expenses show a consistently strong and positive relationship with premiums and it turns stronger when the control variables are added.
- A large extent of the explanatory power of the model is gained from the control variables portfolio concentration and controlling power variables.
- There is a substantial increase in explanatory power and strength of coefficient estimates for the Swedish samples from excluding observations from before 1981.

7 Analysis of empirical evidence: an evaluation of performance

The empirical evidence presented in chapter six is analyzed in three different ways in this chapter. These are

- The significance of estimated coefficients relative to the expected levels from the theoretical model;
- changes in the estimated coefficients over time; and
- an evaluation of the empirical findings in relation to previous research.

In addition to the evaluation of the core findings, the chapter contains an analysis of the measurement of unquoted securities on the relationship between residual return contribution and premiums.

The chapter is divided into five main sections. The first four sections contain discussions on the measures of performance. Each section looks at one part of performance and discusses this part in relation to the theoretical model and time series consistency. The first and largest section focuses on the pure portfolio performance measures i.e. residual return on net asset value and the measures of return on the sub-portfolios. The second section contains an analysis of the residual return contribution from administrative expenses, while the third section contains a discussion of the residual return contribution from taxes. In the fourth section the findings are discussed and related to previous research. The last section contains the discussion of the measurement of unquoted securities.

7.1 Portfolio management performance

Before the discussion of the empirical findings a brief summary of the hypotheses from the theoretical modelling is provided. Future expected performance is expected to be positively related to premiums. The size of the coefficient depends on the time series properties of the residual return contribution measure. Assuming no serial correlation, the coefficient is expected to be slightly below one due to discounting independently of whether residual return on net asset value or on quoted and unquoted securities is used in the regression. Higher coefficients can only be had if the market on average expects positive serial correlation in residual returns and when growth is high. In this study ex post realized returns are used to measure future expectations. If future performance can not be forecast, no relation with future realized returns will be found.

Historic residual returns may have any sign on the coefficient and even zero. As with future residual returns a positive serial correlation would translate into a positive coefficient. If historic performance has no bearings on future performance, a coefficient that is insignificantly different from zero is expected. Conservative measurement of the value of the securities and consequently the residual returns would generate a negative coefficient if the degree of conservatism is transitory and positive if it is constant or growing.

With respect to the deregulation of the financial market and increased market awareness from the public, potentially more significant results are expected for the post-deregulation period than for the pre-deregulation period if market efficiency and competence increase.

Future residual return on net asset value and the contributions to this measure from residual returns on quoted and unquoted sub-portfolios put emphasis on the predictability of future value increases/earnings in these companies. The balance between predictability and simple extrapolation of past performance focuses on whether making specific earnings forecasts for these companies are ex ante possible to do and if such forecasts are incorporated in prices.

7.1.1 Realized future performance

Future performance is the fundamental driver of value in the underlying valuation framework. The realized future performance as an indicator of expected future performance is correct if the realized measure is an unbiased indicator of the expectations. This means that if this is not the case then the coefficients observed in the regressions are not unbiased estimates of the true coefficients. Other variables may then absorb information normally captured in the expected future performance measure. This has to be acknowledged in analyzing the results below.

7.1.1.1 Empirical findings in the light of theoretical expectations

The estimated coefficients on future expected residual return on net asset value is consistently very low. The estimates for the Swedish (sub-)samples range from 0.014 for the pure Swedish companies to 0.143 for the full sample. Both observations are taken from the 1981-2004 regression with controls. The British sample shows theoretically inconsistent negative coefficient estimates of -0.054 to -0.025. The economic significance of these findings is negligible. In order to observe a change in premiums of one percentage point, it requires a residual return contribution of at least seven percent.

The initial conclusion is that future residual return for these companies are difficult to forecast. Consequently, no systematic effect on premiums can be identified. However, alternative explanations must be evaluated.

From a theoretical point of view this can be explained by a large negative serial correlation in expected residual returns. First, such a large negative serial correlation is hard to imagine. Systematic volatility in returns, where the present value of residual returns after the first forecast is of the opposite sign of that forecast, is required. Empirically, the evidence presented on serial correlation in table 6.7 shows that all correlations for the residual return contribution between period t and t+1 are small and in most cases positive.

Tables 3.1a and b show that low growth generates comparatively low coefficients when any serial correlation is present. Low growth is generally obtained when profitability is low. Given that any level of positive serial correlation is present coefficients would then be lower for negative residual returns than for positive residual returns. Depending on the proportion of positive and negative residual returns, the impact on the coefficient estimates is different. The higher the degree of extreme values and negative residual returns the lower the coefficient estimates. Since the regressions do not differentiate on the signs of the residual returns, the coefficient estimates may be affected. Empirical findings suggest otherwise. The accumulated growth for the companies has been high. This is a result of high market growth despite the low residual returns, which has been documented in chapters five and six. Additionally, the serial correlation is low.

Ex ante expected residual return on quoted securities is zero if capital markets are efficient with respect to current public information. Limited efficiency could result in expectations above zero if private information or superior analytical ability is present. From the perspective of regression analysis, zero expected residual return would imply an insignificant coefficient on the residual return on quoted securities. Additionally, this also has strong implications for the coefficient on net asset value, since residual return on quoted securities substantially contributes to the residual return on net asset value. The higher the proportion of quoted securities the more likely it is that the estimated coefficient on the residual return contribution from net asset value goes towards the coefficient for the quoted securities[147].

As expected, the residual return on quoted securities for all samples and sub-samples are very close to zero. This also holds for the British sample if the residual return on net asset value is a good estimate of the residual return contribution from quoted securities. The proportion of quoted securities is high. This suggests that the conclusion holds for the British sample.

The largest deviation from zero is found for the pure Swedish investment companies with -0.037 on average and -0.021 as the median for the 1981 – 2004-period. Less negative means are found for the 1972 – 2004 period. However, the significance level is low. The descriptives for the observation included in the regression show only insignificant levels for all cases.

The correlations between premiums and residual return contributions from quoted securities are low. This observation further strengthens the evidence that there is no immediate premium effect from quoted securities. The indirect market pricing through the closed-end investment company and forecasting ability of the expected returns from quoted securities are in line with standard financial theory.

The proposed impact on the coefficient on residual return from net asset value is probably strong. The sizes of the standard deviations for residual returns on quoted and unquoted securities are approximately equal. Along with low correlation between the residual return measures, this suggests that the impact is possibly approximately proportional to the relative sizes of the

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[147] This is not simply a weighted average of the two coefficients, but most importantly a matter of the distribution of the two components, residual return from quoted and unquoted securities.

portfolios[148]. Consistent with this observation, the smallest coefficients on residual return from net asset value are found for the British sample and the pure Swedish companies.

The other component of residual return on net asset value is the contribution received from the residual return from unquoted securities. As for the quoted securities it is important to acknowledge that the operationalized variable includes two parts of the final residual return effect. These are the relative size of the sub-portfolio of (un)quoted securities and the actual return on that sub-portfolio.

The residual return contributions from unquoted securities show slightly higher medians than the quoted securities do for all Swedish (sub-)samples, while the mean is lower. The immediate conclusion is that the sample contains companies that generally make investments in unquoted securities that are approximately as good as market investments ex post. However, when a bad investment is made the hit is severe. The existence of conservative measurement practices for unquoted securities may reduce the mean. The implications of conservative measurement practices are further discussed in section 7.5.

Having observed this characteristic of the sample, the focus turns towards the relationship between premiums and the residual return contribution from unquoted companies. Most importantly, the large negative residual return contributions, if they are expected, should decrease premiums and generate a positive correlation with premiums. The correlation is much stronger for this variable than for the overall residual return on net asset value. Still, the evidence shows that the market can not foresee and/or value the one period ahead residual return contribution from unquoted securities with much precision, since correlations remain weak.

The difference between the residual return contributions from quoted and unquoted securities is further substantiated by examining the regression coefficients. The estimated coefficients on the one period ahead residual return contributions from unquoted securities are about twice the size of the coefficients on the residual return on net asset value. Since no market value

[148] The standard deviation may be driven by a few extreme observations for one variable or a more homogeneous variability. If one variable has extreme observations, the OLS estimates will put large emphasis on these extremes in calculating the coefficient estimates.

is present here to use as an objective value of the security, a direct valuation of the holding in the portfolio company is necessary. The valuation of the holding is based on either the cash flows generated within the company if the holding of the shares is expected to be long term or the expected exit value if a sale is nearby[149]. Both of these measures are directly related to future events with residual return consequences that have to be specifically evaluated. Either core profitability is estimated, resulting in unrealized gains/losses, or realized gains/losses through the sale. These gains/losses do not in expectation have to equal the required rate of return and they should have a direct effect on premiums.

Even if the coefficients are much higher for the residual return contribution from unquoted securities than they are for the residual return contribution from net asset value, they are still low from a theoretical point of view. The highest coefficient is 0.287, which is obtained for the Swedish all companies sample 1981-2004 with controls. Two things can be observed here. First, the need for economic significance is crucial, i.e. that the proportion of unquoted securities is non-negligible in order to have an effect on value. The highest level of unquoted securities for the full sample and the corresponding highest coefficient verify that. The lower coefficients obtained for the sub-samples and particularly the pure investment companies do not have to indicate that independently of the level of unquoted securities the impact on premiums is low for these groups. The more reasonable conclusion is that the residual return contribution is so small due to low levels of unquoted securities. Add to this, the inherent difficulties in measuring the return on unquoted securities. From this perspective, the coefficient estimate obtained for the firms with the highest level of unquoted securities is the most important estimate[150].

[149] Of course, the sales price is a function of cash flows generated within the owned company.
[150] Of course, this line of reasoning is also applicable to the quoted securities.

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel A: Firm-year observations December 1972 - December 2004				
Residual return contribution: net asset value in period t+1, $\left(RRC^{eat}_{nav,t+1}\right)$	0.140***		0.079	0.071
Residual return contribution: net asset value historic average, linear, $\left(RRC^{eat}_{nav,hist}\right)$	0.566***		0.545***	0.006
Residual return contribution: net asset value historic average, cubic, $\left(RRC^{eat}_{nav,hist}\right)$	-5.116***		-5.308***	2.283
Panel B: Firm-year observations July 1981 - December 2004				
Residual return contribution: net asset value in period t+1, $\left(RRC^{eat}_{nav,t+1}\right)$	0.152***	-0.049**	0.092*	0.055
Residual return contribution: net asset value historic average, linear, $\left(RRC^{eat}_{nav,hist}\right)$	0.630***	0.229***	0.615***	1.030
Residual return contribution: net asset value historic average, cubic, $\left(RRC^{eat}_{nav,hist}\right)$	-5.451***	-0.197***	-5.688***	-0.006

Table 7.1: Coefficient estimates on residual return contribution from net asset value for regressions without control variables. Regressions are based on equation 6.1. Only the observations from the original regression including the control variables are used. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

Second, the coefficient estimates increase when the control variables are included in the model. The observed coefficient changes are caused by either of two effects, the change in the sample due to the limited supply of the control variables or that the control variables eliminate biases in the estimates due to previously omitted variables. Tables 7.1 and 7.2 include the coefficient estimates on the residual return contributions from net asset value and the sub-portfolios respectively in regressions without the control variables. The observations used are used the observations from the original regressions with the control variables. Comparing the estimates in tables 7.1 and 7.2 with the estimates in tables 6.12 and 6.16 shows the impact from the changes in the samples relative to the inclusion of the control variables.

	Sweden all companies	Sweden sphere companies	Sweden pure companies
Panel A: Firm-year observations December 1972 - December 2004			
Residual return contribution: unquoted securities in period t+1, $\left(RRC_{nus,t+1}\right)$	0.238 (3.305)***	0.139 (1.889)*	0.008 (0.072)
Residual return contribution: unquoted securities historic average, linear, $\left(RRC_{nus,hist}\right)$	0.702 (3.784)***	0.594 (3.028)***	0.117 (0.387)
Residual return contribution: unquoted securities historic average, cubic, $\left(RRC_{nus,hist}\right)^3$	-8.485 (-5.766)***	-8.410 (-5.795)***	-5.784 (-0.754)
Residual return contribution: quoted securities historic average, linear, $\left(RRC_{nqs,hist}\right)$	0.210 (1.558)	0.250 (1.982)**	0.214 (1.843)*
Panel B: Firm-year observations July 1981 - December 2004			
Residual return contribution: unquoted securities in period t+1, $\left(RRC_{nus,t+1}\right)$	0.276 (3.791)***	0.183 (2.465)**	0.142 (1.008)
Residual return contribution: unquoted securities historic average, linear, $\left(RRC_{nus,hist}\right)$	0.785 (4.226)***	0.711 (3.613)***	0.361 (1.188)
Residual return contribution: unquoted securities historic average, cubic, $\left(RRC_{nus,hist}\right)^3$	-8.967 (-6.127)***	-9.096 (-6.297)***	-9.480 (-1.268)
Residual return contribution: quoted securities historic average, linear, $\left(RRC_{nqs,hist}\right)$	0.233 (1.735)*	0.254 (2.036)**	0.236 (2.084)

Table 7.2: Coefficient estimates on residual return contribution from the sub-portfolio for regressions without control variables. Regressions are based on equation 6.2. Only the observations from the original regression including the control variables are used. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

It is clear that the majority of the changes in the estimated coefficients are due to changes in the sample and not to the inclusion of the control variables. Coefficients remain low and strongly related to the strategy chosen by the companies with respect to unquoted securities. Apparently, the information content added from the control variables is not being previously absorbed by the net asset value residual return measures.

7.1.1.2 Sensitivity tests

In addition to the explanations for the low coefficients discussed above, the issue of other risk factors than the ones incorporated in the wide index and the ownership and portfolio variables must be considered. Three additional tests have been performed, the beta adjusted residual returns, the fixed effect regressions and regressions where year dummies are included. The results are presented in appendices 6.7, 6.8 and 6.10.

The results from the regression based on beta adjusted residual return show some changes in the estimate most importantly for the Swedish sphere and pure companies. The coefficient on future residual return on net asset value is generally about twice the size of the original estimates when the beta adjusted values are used. The changes hold for both the full period and the 1981-2004 period. The increases in coefficient estimates are not equally strong when the sub-portfolio residual return contributions are used. Despite the observation that the means of the betas are very close to one, the marginal impact on premiums from residual return contributions is stronger when beta is used as a risk factor. This is corroborated by an examination of the companies which have the largest deviations from zero on their residual return contributions. Some of these companies, like Rang-Invest and Custos, have betas for the years under consideration that differ substantially from one.

The other way to control for firm specific attributes are to run fixed effects regressions. If the dummy variables absorb otherwise firm specific information that affects the estimated coefficients, the coefficients would change when running these regressions. The coefficients on future residual returns for the Swedish and British full samples are hardly affected by the fixed effects. All observed changes are related to the sphere samples. The coefficients are generally increased and they turn out to be in line with the

Swedish full sample[151]. It seems that some additional firm specific risk components are captured by the fixed effects that the sphere companies are particularly exposed to. The sphere companies are all characterized by strong ownership structure and involvement in complicated ownership relations with other firms. Probably some premium relevant information is captured by the fixed effects. Moreover the information is not previously captured by portfolio concentration and controlling power variables.

The use of year dummies have a small but strengthening effect on the parameter estimates.

7.1.2 Historic performance

Historic performance is only value relevant if it is a good indication of future performance. In the case of investment companies, consistent historic performance is an indication of a company's ability to extract private information or analyze public information better than the market and consequently be better at timing their transactions. If the company's management team has these abilities, then positive past performance is likely to be transferred into positive future performance and high premiums. Lack of trust in current management due to bad historic performance would have corresponding negative effects.

7.1.2.1 Empirical findings in the light of theoretical expectations

As discussed in chapter four, the benchmark for coefficients on historic performance is hard to determine. The coefficient absorbs two forces. These are the present value of the extrapolated expectation for future residual returns and the coefficient on historic performance in the time series relation with future performance. The first force is identical to the expectations derived for the direct forecast of future residual returns. The second force can not be determined ex ante. Additionally, the residual return on net asset

[151] Simultaneously, the coefficients on the votes-to-capital times the portfolio concentration interaction variables lose significance.

value and the contribution from unquoted securities is entered in two functional forms in the regression, which are further analyzed in section 7.5.

The historic residual return contribution from quoted securities is only available for the Swedish companies. Due to the low level of unquoted securities in the British sample, the residual return on net asset value can serve as a proxy for the quoted securities and a comparison between the two measures is reasonable.

The estimated significant coefficients range from 0.183 to 0.398 as can be seen in table 6.16 panel B. To a certain degree it appears that the market prices the performance on quoted securities as if they are more consistent over time and history is an indicator of future performance. Reputation could be seen as being important in the evaluation of portfolio management of quoted securities. Note, however, that the sub-sample of Swedish pure companies shows no significant results.

The coefficients are consistently below one and they are most of the time in the range of 0.200 to 0.400. A long-term historic annual residual return contribution of three percentage points, which is substantial, does only materialize on average into a higher premium of 0.6 to 1.2 percentage points. Moreover, a high level of consistency for future performance based on historic performance is contradictory to the negligible serial correlation in the residual return contribution from quoted securities. Given the observed correlations, the estimated coefficients are high

By combining the findings from expected future and historic measures, it is obvious that the market does not put much emphasis on trying to directly forecast future residual return, probably because it is deemed unsuccessful by efficient markets, but it relies on a perceived sense of reputation that can be extrapolated from past performance. The net asset value observations from the British sample match the findings on quoted securities for Swedish companies well as can be seen in table 6.12 panels B and C. The linear variable shows coefficients of about 0.200 and a negligible coefficient on the non-linear variable given its economic impact. The consistency between the Swedish and British findings strengthens the perception that the pricing of the companies is fundamentally driven by the same forces.

The estimates on net asset value and unquoted securities indicate a lack of consistency in the marginal impact on premiums depending on the size of the residual return. This can be seen from the estimates on the cubic form of the historic residual return contributions. Figure 7.1 shows the predicted premiums for various levels of historic residual returns on net asset value and contributions from unquoted securities. The estimated coefficient levels used in the description is taken from the sphere sample for the 1972-2004 estimates with controls, which can be seen in table 6.12, panels B and C and table 6.16, panels C and D.

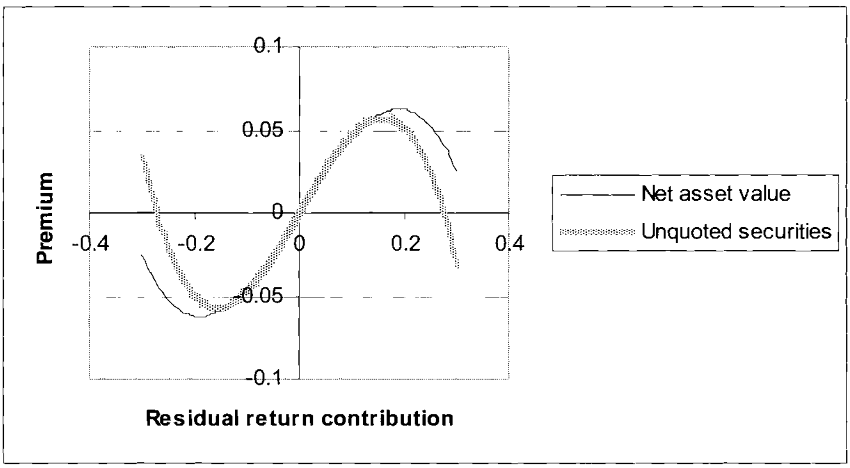

Figure 7.1: Premium effects of historic residual return contributions from net asset value and unquoted securities for the Swedish sphere sample 1972-2004[152]

For the lower absolute values of residual return contributions, the relationship with premiums is positive for both residual return contributions from net asset value and unquoted securities. The sign of the marginal impact changes somewhere between +/-0.15 to +/-0.20 depending on the sample. As an average over several years this is a high level. Consistently low performance at the same time as the market performs very well, as during the mid-1980s, the late 1990s and again in the mid-2000s, causes such situations. Rationally, it is difficult to provide an explanation as to why the mere difference in residual returns contributions should have different marginal and total impacts on premiums.

[152] The lines are calculated using the following equations:
Premium $= 0.495*RRC_{nav,hist} - 4.534*(RRC_{nav,hist})^3$ for the net asset value and
Premium $= 0.543*RRC_{nus,hist} - 7.245*(RRC_{nus,hist})^3$ for the unquoted securities.

The coefficient estimates obtained for past residual return on net asset value are much higher for the full sample and the sphere companies than for the pure companies as can be seen in table 6.12 panels B and C. This could be due to the higher levels of unquoted securities which makes these residual return contributions more influential and easier to estimate. The average effect on premiums for significant estimates using non-extreme residual return contributions is between 0.34 and 0.67 for the full sample and sphere companies[153,154]. The pure Swedish companies show average effects between 0.06 and 0.17 and the British average effect is between 0.14 and 0.24. The effects obtained for the British sample are similar to the Swedish pure firm observation as expected.

The substantial effects from residual return contributions from unquoted securities on premiums are further corroborated by examining the average effects. The average effect from residual return contributions on unquoted securities is about the same as for the residual return from net asset value for the full and sphere (sub-)samples.

Apart from the insignificant findings for the 1972-2004 regressions, the average effects on premiums from the residual return contribution from unquoted securities are between 0.20 and 0.82 for the full Swedish sample and the sphere companies. For the pure companies the same effect is between 0.07 and 0.38. Even if the coefficients do not reach the same levels as for the sphere companies, the effects are generally higher than for the net asset value residual return contributions.

7.1.2.2 Sensitivity tests

The same three kinds of sensitivity tests are performed here as for the future looking resulted return contributions. These are the beta adjusted residual returns, including different calculations for the required rate of return on net financial liabilities, the fixed effect regressions and the regression including year dummies[155].

[153] Non-extreme observations are here defined as from -0.15 to 0.15.
[154] There is a negative observation for Swedish pure firms, but it is only present for the 1972-2004 period without controls.
[155] See section 4.2.4 for a discussion about the beta adjustments.

Almost all coefficients are robust to the sensitivity tests. The coefficients on the residual return contributions from unquoted securities are if anything somewhat strengthened in their significance levels. This is particularly so for the Swedish sphere sub-sample.

One coefficient drops in significance both when beta adjusted returns are used and when fixed effect regressions are run. This is the cubic historic residual return contribution from net asset value. Moreover, the historic residual return contribution from quoted securities drops in significance when the beta adjusted measures and the year dummies are used[156]. As stated above, these two observations should be combined with the increase in the significance level for the unquoted securities. The use of a more firm specific risk adjustment but with the same required rate of return for both unquoted and quoted securities may cause inappropriate adjustments for one of the sub-portfolio. This could cause different effects on the significance levels for the coefficient estimates. More detailed measures appear to be required to capture the specific effects from unquoted securities when firm specific risk adjustments and fixed effects are used.

7.2 Administrative expenses

Administrative expenses have theoretically turned out as a very important explanation for negative premiums on closed-end investment companies. In a straightforward meaning, administrative expenses should be negatively related to premiums unless they proxy for something else that are not properly included in the model and that is premium relevant. The key to an appropriate estimate of the coefficient on administrative expenses is to limit the impact of omitted variables. This issue is further investigated here.

7.2.1 Empirical findings in the light of theoretical expectations

Theory predicts that the administrative expenses should be negatively related to premiums with a coefficient of approximately one over the difference

[156] The same coefficient is marginally strengthened when the fixed effect regressions are run.

between the required rate of return on net asset value and the growth rate[157]. This would reasonably yield a multiple between -10 and -20. Related to this prediction is that companies with higher levels of administrative expenses would have lower premiums on average. The empirical findings do not support these predictions.

The results show that contradictory to theory the estimated coefficients are all positive and, at least when the control variables are included, highly significant. The coefficient levels range from a insignificant 0.965 for the British sample to a highly significant 16.832 for the Swedish sphere sub-sample. As discussed in section 6.3.1, the bivariate correlation coefficient between administrative expenses and premiums is the highest correlation found for any variable related to premiums. Apparently, this correlation holds even when other variables are included in the regressions.

An examination of the regression results and descriptives reveals additional patterns. The coefficient levels for the Swedish companies are much higher than for the British companies. Additionally, the pure Swedish companies have on average the highest coefficients on administrative expenses. They exhibit a coefficient that is 2.5 to 6 times as high as the British coefficients and about twice the size of the full Swedish sample without controls. When the control variables are included the sphere firm sub-sample shows the highest coefficients. The pure companies are less exposed to controlling power than the other two Swedish (sub-)samples. When the control variables are included in the model the estimate may be purified for the sphere companies. This could be indications of a difference between administrative expenses related to agency cost and other expenses. This issue is further discussed in section 8.1.3.

As shown in table 6.3, the British companies have considerably higher levels of administrative expenses, 2.5 to 3 times the level of the Swedish companies. Still the negative premiums are only about two-thirds of the Swedish level. Of course, the difference in premiums can be related to other explanations as discussed before. Given the theoretical predictions for the coefficient levels, it can be expected that British premiums are in the range

[157] Under the assumption of a constant fraction of net asset value being paid as administrative expenses, a traditional Gordon growth model can be applied to the administrative expenses.

of -0.1 to -0.2[158]. This is very close to the observed long run levels. Analyzed in the same manner, the Swedish companies would be expected to have a premium of -0.03 to -0.08. This latter observation is very far from empirically observed levels. Only one Swedish company has managed to have an average premium in line with the expected number derived here[159,160].

These findings indicate that the search for explanations must go towards issues that would drive a positive relationship between expenses and premiums, most likely omitted variables and those that would purify the expense relationship when controls are included. One of these could be a relationship between administrative expenses and returns. Administrative expenses and total returns on net asset value are likely to be correlated. Management rewards are often related to performance. A relationship between size or performance and administrative expenses has been previously documented by for example Coles et al (2000).

The measure of administrative expenses used here relates the expenses to net asset value at the beginning of the period. Note that the denominator is not affected by the performance during the period. If administrative expenses are related to total returns, the administrative expense ratio used increases when the company performs well and decreases when the company performs badly. If total performance is positively linked to premiums, administrative expenses will also be positively linked to premiums. This will materialize if the premium relevant measure of performance is only imperfectly measured as it is included in the regressions. In order to examine the relationship between administrative expenses and total return on net asset value and the total return contributions from quoted and unquoted securities, correlations

[158] The coefficients discussed above of -10 to -20 times 0.01 in administrative expenses over net asset value, given -0.1 to -0.2 in premiums.

[159] This is Svolder, who has had a premium of -0.06 on average during their time on the Stockholm Stock Exchange from starting in 1994. Svolder has been eliminated from the regressions due to its, now expired, forced liquidation clause. Taking the clause into consideration, it could be seen as an indication that the expected levels for the premium may be reasonable if other things are controlled for.

[160] The company still has a clause in their company statutes, which states that at each annual meeting the company has to specifically address the issue of liquidation. If more than 1/3 of the represented voting rights vote in favor of liquidation, the company will immediately liquidate.

between the measures are calculated. The correlations are presented in panel A of table 7.3.

It is clear that the correlation between premiums and administrative expenses is substantially higher than the correlation between administrative expenses and the total returns for the Swedish (sub-)samples. It is also worth noting that when the correlation between the return on unquoted securities and administrative expenses is high so is the correlation with premiums. On the other hand, for the British sample the high correlation of 0.400 between the net asset value return and administrative expenses is the highest. This suggests that a large proportion of the expenses are performance driven in the UK. The conclusion is that the positive coefficient on administrative expenses can not be immediately explained by variations in total levels of administrative expenses that are related to total levels of returns.

The bivariate correlations presented in chapter six presents evidence in favour of the agency prediction. Administrative expenses are strongly correlated with the measures of ownership concentration in the Swedish sample. The correlations presented in table 6.8 lie between 0.264 and 0.484. In the British sample this association is much weaker with correlation coefficients below 0.100. The measures of controlling power, M, are interactions between an ownership concentration variable and the portfolio concentration variable. The correlation between the power variables and administrative expenses is weaker being about 0.100. The other control variable, portfolio concentration, does not have ex ante any particular relationship with administrative expenses. The bivariate correlations are slightly negative in the Swedish case and strongly positive in the British case. In order to isolate the potential effects from the reward systems on the relationship between administrative expenses and premiums, the partial correlation coefficients are calculated. Partial correlation coefficients where portfolio concentration and controlling power are controlled for are presented in panel B of table 7.3.

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel A: Univariate correlation coefficients				
Total return on net asset value, RNAV	0.080	0.400***	0.049	0.133*
Total return contribution from quoted securities, $RNQS_t \times \frac{nqs_{t-1}}{nav_{t-1}}$	0.032		0.017	0.004
Total return contribution from unquoted securities, $RNUS_t \times \frac{nus_{t-1}}{nav_{t-1}}$	0.128*		0.131*	0.148*
Premium	0.168**	0.000	0.216**	0.489***
Panel B: Partial correlation coefficients, controlling for portfolio concentration (PCON) and controlling power (M)				
Total return on net asset value RNAV	0.102	0.399***	0.086	0.162**
Total return contribution from quoted securities, $RNQS_t \times \frac{nqs_{t-1}}{nav_{t-1}}$	0.070		0.054	0.068
Total return contribution from unquoted securities, $RNUS_t \times \frac{nus_{t-1}}{nav_{t-1}}$	0.116*		0.149*	0.162**
Premium	0.236**	0.033	0.281***	0.464***

Table 7.3: Correlations between administrative expenses and total returns measures and premiums using only observations with control variables for the 1972-2004 sample. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level.

The partial correlations between administrative expenses and the total return measures are still low, but they are in several cases much higher than the bivariate correlations. The partial correlation between the total return contribution from quoted securities is more than twice as high as the bivariate correlations for all Swedish (sub-)samples. The impact on the correlations with the net asset value returns is proportionally much lower. The correlations with the return contributions from unquoted securities are almost unchanged. It should still be acknowledged that the partial correlations with total return contribution from unquoted securities are higher than with the total return contribution from quoted securities.

The correlation with net asset value return for the British sample is entirely unaffected when controlling for portfolio concentration and controlling power. The effect on the correlation with premiums is substantial. The partial correlations are much higher than the bivariate correlations for all but the pure Swedish sub-sample. The strongest impacts are identified in the full Swedish sample and for the Swedish sphere sub-sample. These two (sub-) samples are the ones with the strongest effect of the control variables on the magnitude of the coefficients on the administrative expenses in the original regressions in chapter six.

The purifying effect of the control variable puts greater emphasis on the direct relationship between administrative expenses and premiums. The partial correlations are much closer to the ones observed in the pure Swedish companies. The British companies still show very low correlations. The effects of the control variables on the original regression are lower in the British sample. This is consistent with the findings from the partial correlation coefficients.

The conclusion from the analysis of the relationship between administrative expenses and total return measures/premiums has provided us with some evidence in favour of a relationship between total returns and administrative expenses. This is most strongly found in the British case. The impact on premiums is strengthened when the effects of portfolio diversification and controlling power are controlled for. Further analyses of the relationship between the administrative expenses, portfolio concentration and controlling power are provided in section 8.1.3.

7.2.2 Sensitivity tests

The regression with beta adjusted residual returns do not have any effect on how the administrative expenses are measured in the regressions. Consequently, no direct effect could be expected. The indirect effect through the changes in the other performance variables is limited. The coefficients change, in this case increase, mostly within the Swedish sphere sample when the sub-portfolio residual return contributions are used and when the control variables are present. The most appealing interpretation of these observations is that a better measure has been obtained for the combination of residual return contributions from the two sub-portfolios both with respect to risk and pure performance and that this has partially purified the coefficient estimate for administrative expenses. The fact that the coefficient is more positive suggests that even if the measure is purer in some ways it is still contaminated in relation to the theoretical expectation of a negative relationship between administrative expenses and premiums.

Some of the significance of the positive coefficient estimates is reduced when the fixed effect regressions are run. The effect of the use of year dummies is negligible.

7.3 Taxes

Taxes are involuntary expenses that are caused by institutional factors structurally out of control of the company. However, given the institutional setting designed by laws, the company may decide to benefit from the possibility to avoid taxes by aligning its behavior to the tax minimizing strategy. The tax minimizing strategy may not be the same as the value maximizing strategy. In case a tax expense is not expected as a result of the strategy, but anyway incurred and no corresponding increased portfolio return is realized, the coefficient on the residual return contribution from taxes should be negative. On the other hand if the expense is not expected, but portfolio returns correspondingly increase, the coefficient effect is dependent on the effectiveness of the measurement of residual returns. If any positive value effect is channelled through the residual return contribution from taxes, the coefficient will turn less negative or positive. If the residual return contribution from the asset portfolio is measured in such a way that the residual return contribution from taxes does not carry any information about value creating activities except taxes, then the coefficient should remain negative. This is the case of an effective measurement of the residual returns contributions. When a tax expense is expected and when it is correlated with high residual return contributions from the asset portfolio the case is also dependent on the effectiveness of the residual return measurement as above. The regression findings have to be analyzed in two ways, one that is focused on omitted variables and one that is directly related to the tax laws at hand as described in section 5.2.

7.3.1 Empirical findings in the light of theoretical expectations

The coefficient on the residual return contribution from taxes is the most consistently insignificant coefficient of all. In three cases the coefficient reaches the five percent significance level. Two of these cases are the net asset value based regressions for the full Swedish sample for both time periods. The third case is the British sample when the controls are included. In the British case the relatively low significance level is striking since the number of observations is still high. This observation combined with the case that the coefficient is positive and the low economic impact on premiums make the finding less strong. The observations made for the full Swedish sample should be contrasted to the sub-portfolio regressions. All significance disappears when the sub-portfolio residual return contributions are used. This is an indication that the net asset value based measures are inferior as measures of premium relevant residual return information to the sub-portfolio based measures. The insignificant coefficient combined with the unexpected sign for the net asset value based regressions leads to the conclusion that there is no pure tax effect on premiums even in these cases.

7.3.2 Sensitivity tests

The sensitivity tests based on beta adjusted residual return measures and fixed effect regressions do not show any substantially different results from the base regressions. In the case of the regressions based on beta adjusted residual return measures the t-statistics decrease slightly, reducing the probability of an impact on premium from taxes even further. No estimated coefficient reaches significance at the five percent level and only two coefficients are significant at the ten percent level. The fixed effect regressions improve the significance for some coefficients, but still the overall evidence is weak. The positive impact for the full Swedish sample for the full period is now significant at the one percent level, but as before the significance disappears when any adjustments are made to the regressions. The coefficient on taxes for the sphere sample when the controls are included turns weakly significantly negative. The strongest finding is obtained for the 1981-2004 period with controls. A strongly negative and significant coefficient is obtained for the British sample for the 1981-2004 period. Such a finding suggests that the residual returns for British companies are on average accurately measured and that the companies are punished when tax expenses are present. The effect from including the control variables is contradictory to this interpretation. In this case the coefficient on taxes turns positive and almost as significant as the negative coefficient without controls. The conflicting findings are cumbersome from an interpretive perspective and further emphasize the possibility to obtain strongly significant but not necessarily stable coefficients with large samples. The use of year dummies to not alter the results.

7.4 Implications and previous research

The findings presented here are consistent with previous research. Previous research has tried to relate current premiums to both past performance and expected future performance. Most of the studies have been based on pure net asset value returns as a measure performance. Later studies have tried to elaborate a bit more on the performance measure to adjust for the impact of some kind of market performance.

The early studies by Malkiel (1977, 1995) and Thompson (1978) did not provide any support for a relationship between performance and premium levels. Some later studies, such as Chay (1992), and Chay and Trzcinka (1999) have found support for a positive relationship between the two components. Generally however, the empirical findings give only marginal support for an existence of a relationship between the variables at hand. Dimson and Minio-Paluello (2003) found a negative but insignificant relationship between premiums and future performance. These latter findings spurred a search by the authors for a more sophisticated measure controlling for the market performance effects. Dimson and Minio-Paluello elaborated on the initial test using net asset value returns to correct for the mix of the assets. Effectively, they tried to control for the return on a buy and hold strategy given the asset mix. Their conclusion was that the premiums reflect past performance but they carry no information about future performance. Bleaney (2002) confirmed these findings. The two latter studies are performed on British data and they are thereby directly related to the present study. The positive association between premiums and past residual return and the lack of a relationship with future performance found in this study is consistent with the findings by Dimson and Minio-Paluello and Bleaney. The statistically significant but economically weak negative relationship between future performance and current premiums is also compatible with previous findings.

Concerning administrative expenses weak results have been found in previous research. The works by Malkiel (1977) and Boudreaux (1973) give no support for a relationship between administrative expenses and premiums. Kumar and Noronha (1992) scaled administrative expenses by dividends and administrative expenses, i.e. a cash flow or an income statement measure. They conclude that when administrative expenses are measured like this, it is possible to identify a negative relationship between premiums and administrative expenses. This could be seen as a control for the underlying return on the portfolio, which has been discussed above.

The current findings are equally weak as the results from past studies. The puzzling evidence of a positive relationship between administrative expenses and premiums is somewhat contradictory to previous findings. Kumar and Noronha found a positive relation for individual years in their study but no consistent findings over time. Additional tests with regard to this anomalous finding are presented in chapter eight, where the evaluation is continued.

Previous research with respect to taxes have focused on unrealized capital gains as carrying deferred tax effects and the loss of tax timing options by the individual investor. The tax liability story appears to have gone out of fashion over the past 15 years probably due to the lack of empirical support. Malkiel (1977) discussed the matter and found that only a minor proportion of the negative premiums could be explained by tax liabilities. The direct and indirect empirical evidence provided by Lee, Shleifer and Thaler (1990) and Pontiff (1997) is if anything contradictory to the expectations. The structure of the legal tax system is such that taxes are in most cases avoidable both in Great Britain and in Sweden. In the present study, the realized tax expenses have been used to measure the effect from taxes. The realization is the measure rather than the potential tax expense. The evidence provided here is readily interpreted as a lack of support for the tax liability argument in line with previous research.

7.5 The measurement of (unquoted) securities

The impact of the measurement of assets and liabilities on the balance sheet and consequently on the measurement of net asset value has been widely explored. It is clear that the degree of conservatism in the measurement procedures affects both the balance sheet and the income statement. The characteristics of the impact depend on three core components,

- the measure we analyze
    - earnings or
    - returns or
    - net asset value or
    - residual returns,
- the level of growth, and
- the continuity of conservatively measured investments

Given continuous investments and re-investments and low to moderate growth, conservative measurement brings

- understated earnings[161]
- overstated returns[162]
- understated net asset value and
- overstated residual returns[16]

As for single projects or non-continuous investments the case becomes more complicated. In a negative return environment, the conservative measurement practices as applied in an accounting context would result in appropriate measures in all four cases. Short-term negative environments could give overstated measures, but this misrepresentation would reverse shortly. In a positive return environment, no gains would be recognized on the assets even if the market value increases. This would lead to understated values on all four measures. In the period when the capital appreciation is realized, earnings, returns and residual performance will be overstated and net asset value will return to an unbiased estimate of value. From a time-series perspective, conservative measurement and non-continuous investments will drive expectations of reversals in residual return

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[161] Earnings are unbiased if no growth is present and overstated with negative growth.

[162] Returns and residual returns become understated if the growth in the measurement bias is sufficiently large.

contributions in the future. This will happen in order to compensate for historic negative residual returns contributions. This also means that premiums ought to be negatively correlated with past negative residual returns unless the perception of the total value of the investment has changed. The opposite will be the case if aggressive measurement is applied. Consequently, the presence of biased measures of value of the net asset relative to market values affects our measure of premiums. Note that conservative and aggressive measurement is a violation of the initial assumption of how premiums are measured.

The presence of two different functional forms for past residual return contributions on unquoted securities has enabled an analysis of the effects of conservative measurement practices. The linear variable is said to measure the reputation or extrapolation effect of past residual returns, i.e. that the history is a good indicator of future residual returns. The non-linear variable, i.e. when historic residual returns are raised to the power of three, are meant to capture conservatism crudely. This is so only if conservatism is strong enough to have a substantial effect on residual returns. Persistent residual performance due to ability/skill is expected to be at most a few percentage points a year. Conservatism and particularly measurement at acquisition cost will give residual returns equal to minus the required rate of return. This figure could be large in absolute terms. The trade-off between the impacts from the reputation effect and the conservatism effect is determined as the point where the first derivative of past residual returns contributions on premiums turns negative. Stated differently, it occurs when and if the impact on premiums from a decrease in residual returns turns positive.

The relationship between historic residual returns and premiums has been graphically displayed in section 7.1.2.1, figure 7.1. As observed in chapter seven, the derivate of historic residual returns on premiums turns negative between residual returns of -0.15 to -0.20 for the Swedish companies. The effect estimated for the British companies is almost unobservable despite the significant coefficients, and no change in the first derivative is observed for reasonable levels of residual returns.

Two clear indications should be emphasized on the basis of these observations. First, British companies provide market estimates of the unquoted securities in the portfolio. The market estimates are made by the management team. Given that these estimates are unbiased estimates of market value, no conservatism is present for the British companies. The coefficient estimates for past performance indicate that the valuation of unquoted securities made by the management team and/or directors is perceived to be unbiased estimates by the market.

Second, the Swedish companies do not generally provide such estimates and particularly not for the older observations. There are in total 12 observations in the Swedish sample where the historic residual return contribution is below -0.15[163]. All of these companies used conservative valuation techniques at the time of the observations. The negative relationship between residual returns and premiums can consequently be seen as a rational response to measurement biases in the net asset value.

The residual returns contribution can turn negative for two interactive reasons. The total return can be low or negative and the required rate of return, the benchmark, can be high. This is problematic when the required rate of return is measured ex post as the realized return on the market portfolio. The negative effects are substantial in those years when market returns are high, such as during the early and mid 1980s and the late 1990s. The unadjusted measures of earnings and returns do not necessarily behave in a similar manner and particularly not so if they are conservatively measured. When conservative measurement practices are employed two scenarios are foreseeable.

- First, if the market value of an investment decreases the value of the investments in the balance should decrease equally much, at least if it can be assumed that the downturn is not temporary. This is the write down/impairment of fixed assets. Consequently, the effect is similar to the fair value valuation.

  $$RNUS_{market} <= 0 \text{ then } RNUS_{conservative} <= 0$$

- Second, in case values increase no gain is reported and earnings and returns are zero until the gains are realized by an external transaction.

  Prior to realization
  $$RNUS_{market} > 0 \text{ then } RNUS_{conservative} = 0$$

163 These observations stem from five different companies, Bacho/Promotion, Säfveån, Ratos, Custos and Gorthon.

At realization for holdings more than one year old and assuming increases in value
$RNUS_{\text{conservative}} > RNUS_{\text{market}}$

As a result, companies that show zero total return contributions would exhibit a negative relationship between residual return contribution and premiums, since they are driven by conservatism. This is so since assuming a normal positive market return would yield a negative residual return contribution, while premiums would increase. A positive total return contribution could have a zero impact on premiums, in case no reinvestment in unquoted securities is made independently of the sign of the residual return contribution. Companies that show negative total return contributions should exhibit a zero to positive relationship between residual returns and premiums.

	With dummy	**Without dummy**
Residual return contribution: unquoted securities historic average, linear, $(RRC_{nus,hist})$	0.639***	0.777***
Residual return contribution: unquoted securities historic average, cubic, $(RRC_{nus,hist})^3$		-8.561***
Residual return contribution: unquoted securities historic average, cubic, $(RRC_{nus,hist})^3$ x the dummy	-8.152***	
Adjusted R-squared	0.330	0.309

Table 7.4: Coefficients on the historic residual return contribution measures for unquoted securities for the 1972-2004 Swedish (sub-)samples with controls: A dummy is included which takes on the value of 1 if the total return contribution from unquoted securities is greater than -0.005 and zero otherwise. The dummy is multiplied with the residual return contribution from unquoted securities in its cubic form. The original cubic form historic residual return contribution from unquoted securities is then removed from the model. The regressions are in all other aspects identical to the regressions based on equation 6.4. * indicates ten percent significance level, ** indicates a five percent significance level and *** indicates a one percent significance level using White standard errors.

In order to test the proposed effects of conservative measurement practices a dummy variable has been constructed, which takes on the value of 1 if total return contribution from unquoted securities is greater than -0.005, i.e. the second case above, and 0 otherwise. The dummy variable is thereafter multiplied with the cubic historic residual returns contributions from unquoted securities. This new variable is included in the regression. The original cubic formed variable is excluded from the model. The two variables measuring residual return contributions from unquoted securities are the cubic form times the dummy and the linear variables. Table 7.4 displays the estimated coefficients on the three past residual return components.

The results from the adjusted regressions are supportive of the measurement hypothesis. The estimated coefficients are marginally smaller than the original estimates, but they are still of the same sign and strongly significant. The relationship between premiums and historic residual return contribution from unquoted securities is thereby unchanged by the redefinition of conservatism. The adjusted R-square increases by more than two percentage points. In relation to the original level of R-square of 0.309, this is an increase of about 6.8 percent, which is substantial. Identically adjusted regressions have been run for the other time periods and sub-samples of the Swedish data and the additional explanatory power of two to three percentage points remain. It appears that the increase in explanatory power results from better estimates for some of the large residual return contributions meaning that the premium impact from small residual return contributions is still extremely small.

7.5.1 Concluding comments and previous research

A special case of the valuation of net asset value has been investigated in section 7.5. This is due to the valuation made by the management team of investments in unquoted securities. If a positive or negative premium is due only to these measurement biases the premiums are only a construction or as Dimson and Minio-Paluello (2002) phrase it "we first ask whether or not it is really there". The level of unquoted securities is on average much higher for the Swedish companies than for the British companies. In addition detailed data have been used only for Swedish companies due to limited access to British data. This makes the findings potentially country specific. Drawing on the accounting literature of conservative measurement of accounting information, related patterns with respect to profitability can be expected in this case. The findings presented here suggest that the market appears to acknowledge the measurement issue when pricing the Swedish closed-end investment companies. When trying to refine the measure of conservatism, marginal improvements have been identified. The conclusion is that to a certain degree, premiums are a function of measurement biases in unquoted securities. Given that the proportion of unquoted securities is rather small combined with the residual return contribution and coefficient level, the effects are far too small to be able to conclude that it solely explains premiums. Moreover, the observation regarding conservative measurement practices would generate positive premiums and not the observed negative ones.

The British data show no evidence on aggregated net asset value data. In order to explain the universal existence of negative or positive premiums, the valuation of unquoted securities has limited power. However, in trying to understand the difference between the Swedish and British companies, the approach appears to have provided some additional insights. Finally, the findings are consistent with the accounting literature implying that the closed-end investment companies are not exposed to other valuation forces than any other business entity.

These findings are not comparable to any previous research identified.

8 Portfolio diversification and power

In this chapter, two of the explanations are discussed in more detail. These are portfolio diversification/concentration in the context of heterogeneous beliefs and dimension of power and agency costs. The focus is on how they affect premiums and the estimated regression coefficients. Moreover, some additional tests are presented which are aimed at providing a deeper understanding of the nature of the issues at hand and their relationship to premiums and the independent variables. Finally, in the context of agency costs the impact of the inherent risk in the asset portfolio of the closed-end investment company on the premium is analyzed.

All of the subjects discussed in this chapter are dependent on portfolio composition. The portfolio diversification and controlling power are focused on the relative distribution of individual assets within the portfolio of quoted securities. Note that the issues of portfolio diversification/concentration related to power and agency costs are both discussed in section 8.1 due to the close relationship between the measures and the conceptual problems of the two issues.

8.1 Portfolio concentration and ownership structure

Portfolio concentration and ownership structure are two potentially value relevant concepts that start with the perception of the company held by the individual investors. These perceptions are assumed to affect observed market prices. The underlying assumption of the discussions about portfolio diversification and power is that the minority shareholder is a key player in setting prices on the stock market. This is important for two reasons. First, from the heterogeneous beliefs perspective investors with no influence over the portfolio structure can only accept the portfolio composition and price it according the investors subjective beliefs given the alternative investment opportunities. The combination of no influence and negative subjective beliefs could generate negative premiums. The chance that there exist negative subjective beliefs increases with portfolio diversification. However, if investors with influence over the portfolio composition were active and could affect prices, they would correct for any price deviation from the underlying value and make arbitrage profits. Consequently, the assumption of the minority shareholders as price setters is essential and the measure of portfolio concentration is used to capture the underlying driving forces for the value effects. The measure of portfolio concentration is further discussed in section 8.1.1.1.

Second, assuming that the non-influential minority shareholders are price setters on the market is essential in the agency perspective too. Traditional agency theory sees a conflict between owners (the principal) and the management team (the agents) (e.g. Ross, 1973). In the present study, this relationship is not the agency conflict being analyzed even though it might exist. The agency conflict emerges here due to a tension between the non-influential capital providers/minority shareholders (the principal) and the strategy determining majority shareholders (the agent). From a strategic perspective, the majority shareholders are entrusted with the capital provided by the minority shareholders. The majority shareholders provide at least the guidelines for the direction of the capital towards different investment opportunities. Thereafter, the operative decisions may be made by a management team. This delegation of power by the majority shareholders may incur another layer of agency conflicts unless there is an identity between majority shareholders and the management team. However, from the price setting minority shareholder perspective at least one layer of agency conflicts may occur. The strategic dimension between the majority and minority shareholders is in focus here, i.e. the ownership concentration. This is a similar approach as the one taken by Jensen and Meckling (1976), when an identity between the majority owner and the management team is assumed.

It has been argued in chapters one and four that the interaction between the two concepts may have additional value effects. This is due to indications that the formal power held by majority shareholders is also used to control/influence other companies when portfolio concentration is high. Observed actions materialized in portfolio concentration are assumed to reveal the ambitions of the majority shareholders, which then may be in conflict with the value maximizing aims of the minority shareholders. The combination of high formal power (ownership concentration) and high portfolio concentration is called controlling power.

This section examines the portfolio and ownership concentration both separately and jointly (controlling power). The analysis gives us a better understanding of the perceptions and behaviors of individual investors. Moreover, the effects are examined by using both cross-tabulations of mean premiums for groups with different characteristics with respect to portfolio concentration and ownership concentration and by using regression results. The regressions have been presented in chapter six in terms of the inclusion of control variables to the original regressions that focused on profitability measures. Finally, the relation between portfolio and ownership structure and administrative expenses is further elaborated.

8.1.1 Analyses based on cross-tabulations of premiums

The first step of the analysis is to examine whether there are any differences in premiums for groups of companies based on the two dimensions of interest, portfolio concentration and ownership structure. No specific assumptions regarding the form of the relationship between the independent variables are made.

8.1.1.1 Portfolio diversification – individual effects

The issue of portfolio diversification originally stems from the fundamental problem of who should perform the diversification, the company or the individual. Pure diversification is only to a limited degree the business of the closed-end investment companies. Diversification in combination with the use of perceived non-public information and/or superior information process ability is the key to portfolio choice. The effect of this combined effort on the value of the closed-end investment company is then a matter of two information streams to the shareholders, the return on the portfolio and the approval of the investors of the chosen portfolio composition. The first issue is discussed in chapters six and seven.

The approval of the portfolio of securities is ultimately a choice made by the individual investor. As long as the active investors have negative perceptions of some of the securities in the portfolio in relation to the market value of those securities, the perceived total value of the portfolio of securities, i.e.

the net asset value, is less than the stated one[164]. This is so since the individual investor may always buy the shares they are positive about on the market at the market price. This can be represented in mathematical terms by setting the perceived individual value of the portfolio of securities being the sum of the minimum of the perceived value and the price for each security in the portfolio less the value of debt, as in 8.1

$$V_{nav,i} = \sum_{n=1}^{N} \min(V_{n,i}, P_n) - D \tag{8.1}$$

N = is the number of shares included in the investment company portfolio and it defines the specific content of that portfolio
$V_{nav,i}$ = the subjective net asset value to investor i
$V_{n,i}$ = subjective value of share n to investor i

The situation can also be interpreted as a matter of transparency. A more concentrated portfolio of securities is more transparent and easy to evaluate for the individual investor. The ultimate level of transparency is when the investment company only holds one single security. The closed-end investment company is then effectively a holding company[165]. This could also be seen as a partial liquidation of the company since in the extreme case with only one security in the portfolio, the investment company is that security[166]. The implication of this is that given the size of the portfolio a more diversified portfolio increases the probability that many individual investors have negative perceptions of parts of the portfolio. Consequently, the price of the shares of the closed-end investment company will be less than the net asset value of the company. Portfolio diversification/concentration should be negatively/positively related to premiums. Two hypotheses can be formulated[167]:

- Companies with high portfolio concentration have above average premiums

[164] A similar positive impact on value is not considered since the investors can replicate the portfolio directly and then buy the shares for which they have positive perceptions at current market price.
[165] In this case, the company would loose its investment company status for tax purposes both in Sweden and in Great Britain.
[166] Some tax timing possibilities may arise from having a holding company that differs from a direct ownership of that security.
[167] The two hypotheses are somewhat overlapping, but sample characteristics can provide different results on the hypotheses.

- Companies with high portfolio concentration have higher premiums than companies with low portfolio concentration

	1972-1980	1981-2004
Panel A: Swedish all companies		
Low portfolio concentration (PCON) (deviation from mean premiums for the period)	-0.001 (60)	-0.026* (77)
High portfolio concentration (PCON) (deviation from mean premiums for the period)	0.001 (60)	0.026 (77)
Difference in premiums between high and low PCON	0.002	0.051*
Panel B: British all companies		
Low portfolio concentration (PCON) (deviation from mean premiums for the period)	N/A	0.001 (199)
High portfolio concentration (PCON) (deviation from mean premiums for the period)	N/A	-0.001 (199)
Difference in premiums between high and low PCON	N/A	-0.002
Panel C: Swedish sphere companies		
Low portfolio concentration (PCON) (deviation from mean premiums for the period)	0.036 (40)	-0.040*** (68)
High portfolio concentration (PCON) (deviation from mean premiums for the period)	-0.036 (41)	0.039** (69)
Difference in premiums between high and low PCON	-0.072	0.079***
Panel D: Swedish pure companies		
Low portfolio concentration (PCON) (deviation from mean premiums for the period)	-0.004 (35)	-0.034*** (40)
High portfolio concentration (PCON) (deviation from mean premiums for the period)	0.004 (36)	0.033** (41)
Difference in premiums between high and low PCON	0.008	0.067***

Table 8.1: Tests of deviations from time period specific mean premiums and differences in mean premiums between groups depending on whether the observation has a portfolio concentration above or below the median for that (sub-)sample for two time periods, 1972-1980 and 1981-2004. One sided t-tests are performed based on the predictions on page 209 - 210. * indicates ten percent significance level, ** indicates a five percent significance level and *** indicates a one percent significance level.

The negative impact on premiums from diversification requires a group of investors that actively trade the share of the closed-end investment company. This group of investors must also have strong perceptions of the value of the individual shares of the portfolio of securities held by the closed-end investment company. If these requirements are not fulfilled, diversification should not have any effect on the perceived value of the closed-end investment company. Some exceptions to the no effect case, which potentially would generate positive premium effects, can be identified. One exception occurs when diversification through the company is less expensive than diversification by the individual investor. Another exception occurs when investment restriction applies and the investment company can circumvent these restrictions. This latter exception becomes more accentuated when the number of competitors to the closed-end investment companies is low. As shown in chapter five, this was the case in the 1970s in Sweden. This enriches the current study with a dimension based on the competitive situations in two dimensions, the stock market regulation and the services provided to investors.

A two-step process to analyze the impact of portfolio concentration is employed. In table 8.1, premiums for companies with high and low levels of portfolio concentration for the period 1972 – 1980 and 1981 – 2004 are presented. The high and low levels are defined as above or below the median portfolio concentration for that sample. High and low portfolio diversification groups are presented for both the full Swedish and the full British sample along with the two Swedish sub-samples.

Two observations can be made. First, the premiums on Swedish closed-end investment companies are strongly affected by the portfolio concentration of quoted securities. In table 8.1, the 1981-2004 data show that a concentrated portfolio of securities results in a five to seven percentage points higher premiums than a highly diversified portfolio does. This difference is statistically significant at high levels for the sub-samples. Moreover, the premiums for the high portfolio concentration groups are significantly greater than the average premium for the sphere and pure sub-samples. The British companies show no difference in premiums between the two groups. The findings from the Swedish sub-sample are consistent with the hypotheses.

It should be noted here that there is a marked difference in the level of concentration between the Swedish and British data, where the Swedish companies on average have a much higher concentration level. Table 6.4 showed that portfolio concentration for the British companies is 0.165 and for the Swedish companies between 0.473 and 0.498 on average. This difference in concentration levels suggests that the threshold as to when diversification and individual preferences become relevant is remarkably high.

Second, there is a distinct difference in premium effects for the Swedish (sub-)samples between the 1972 – 1980 period and the 1981 – 2004 period. Given the strength of the findings for the 1981 – 2004 period, the negligible or negative differences in premiums for the former period is informative[168]. The findings are consistent with the proposed explanation based on less competition and more regulated financial markets. The role as important financial intermediaries for the individual investor has diminished. The perceptions of the individual investors as shown by the valuation effects have thereby changed. The general gloomy market conditions in the 1970s might have affected the companies if diversification was then perceived as insurance towards downturns.

8.1.1.2 Ownership structure – individual effects

The theory of the importance of ownership structure for value originally stems from the agency theory literature. The majority owners have the power to extract private benefits from the company at the expense of the minority shareholders. This behavior has effects on the value of the shares traded by the minority shareholders. Note that this is not the same as saying that the value of the entire company is less because of the ownership structure, but only that the total wealth is split between the owners disproportionally. The existence of dual class shares has exaggerated the effects of control in relation to capital supply to the company and thereby potential agency effects. It has also been emphasized that the mere existence of a situation where agency predicted actions may occur is sufficient to have a price effect, even though no immediate trace of such actions are available as have been

[168] A statistical test shows that there is a significantly negative difference in premiums for the sphere sub-sample in 1972 – 1980.

shown in chapter one through four[169]. In this section only the direct effect from a superficial agency situation is examined, i.e. where the ownership structure is such that an outsider would expect there to be room for actions in line with agency theory. The concept of ownership structure is measured here in three different ways. These are the percentage of votes held by the largest shareholder (or shareholder group/family) ($OCON_3$), the percentage of capital provided by the largest shareholder ($OCON_2$) and the votes-to-capital ratio[170] ($OCON_1$). Three hypotheses can be formulated:

- Companies with high/low ownership concentration have below/above median premiums.
- Companies with high ownership concentration have lower premiums than companies with low ownership concentration.
- The votes-to-capital measure ($OCON_1$) shows stronger results than the percentage of votes ($OCON_3$) and the percentage of capital ($OCON_2$).

The votes-to-capital ratio is only examined for the Swedish (sub-)samples, since voting differentials are not present for the British companies. The lack of voting differentials also drives the case that the results for the percentage of votes and the percentage of capital provided are identical for the British sample. Furthermore, since information about the ownership concentration is limited for the early years of the samples, data is only displayed for the time period 1981-2004 for the Swedish sample and 1999-2004 for the British sample. The initial examination is done through simple cross-tabulations of the means of premiums based on above or below median ownership concentration for each (sub-)sample and time period. Test have also been performed based on means of premiums for groups with above or below 20 % of the votes held by the largest shareholder No significantly different results have been identified.

Tables 8.2 and 8.3 show the deviation from the overall premium means for the high and low levels of ownership concentration measured as percentage of votes ($OCON_3$) and capital ($OCON_2$) respectively. The last row in each panel shows a test of difference in premium means between the high and low

[169] The issue have been discussed in sections 1.1, 2.4, 3.2 and 4.3.
[170] Recall that the votes-to-capital ratio is defined as the percentage of votes held by the largest shareholder.divided by the percentage of capital provided by the largest shareholder.

ownership concentration groups. Contradictory to the general agency predictions, no statistically significant impact on premiums can be found based on percentage of votes held by the largest shareholder for any of the Swedish (sub-)samples. In fact the premium levels are more negative when the ownership concentration is below the median concentration level. The evidence found here suggests that Swedish individual shareholders look favorably on strong owners.

	1981-2004
Panel A: Swedish all companies	
Low ownership concentration (deviation from mean premiums)	-0.015 (77)
High ownership concentration (deviation from mean premiums)	0.015 (77)
Difference in premiums between high and low OCON	0.030
Panel B: British all companies	
Low ownership concentration (deviation from mean premiums)	0.012** (199)
High ownership concentration (deviation from mean premiums)	-0.012* (199)
Difference in premiums between high and low OCON	-0.024***
Panel C: Swedish sphere companies	
Low ownership concentration (deviation from mean premiums)	-0.007 (69)
High ownership concentration (deviation from mean premiums)	0.007 (68)
Difference in premiums between high and low OCON	0.014
Panel D: Swedish pure companies	
Low ownership concentration (deviation from mean premiums)	-0.024 (40)
High ownership concentration (deviation from mean premiums)	0.023 (41)
Difference in premiums between high and low OCON	0.047

Table 8.2: Tests of deviations from time period specific median premiums and differences on mean premiums depending on whether the observation has an ownership concentration above or below the median for that (sub-)sample for the 1981-2004. Ownership concentration is measured as the percentage of votes held by the largest shareholder ($OCON_3$). One sided t-test are performed according to the hypotheses on page 213. * indicates ten percent significance level, ** indicates a five percent significance level and *** indicates a one percent significance level.

In the British case the situation is reversed. The difference in means is statistically significant and the group with the highest level of ownership concentration shows the most negative premiums. The difference is 2.4 percentage points, which corresponds to 17.6 % of the negative premium for the high ownership concentration group. It must be emphasized that the level of ownership concentration is much lower for the British sample than for any of the Swedish samples. The percentage of votes held be the largest shareholder is only 11.4 % for the British sample compared to between 30.2 % and 36.7 % for the Swedish (sub-)samples on average. The generally lower levels of ownership concentration and the lower standard deviation of the measure suggest that ownership concentration is more strongly rejected by the minority shareholders in the British case than it is in the Swedish case.

The percentage of capital as the measure of ownership concentration further substantiates the findings from the percentage of votes case above. The mean premiums are more negative for the low levels of ownership concentration than they are for the high levels for the Swedish companies.

The Swedish companies provide an opportunity to investigate a third measure of ownership structure. This is the votes-to-capital ratio. The deviations from the overall mean premiums for above and below median groups of the votes-to-capital ratio along with tests of the difference in premiums between the two groups are presented in table 8.4. The results are stronger and in contrast to the previous findings. The current findings are consistent with the prediction from agency theory as it is employed here.

Companies with high levels of ownership concentration show premiums, for the full Swedish samples, that are 8.0 percentage points more negative than companies with low levels of ownership concentration do. The difference is even higher, 9.0 percentage points, for the sphere sub-sample, which by construction is expected to be more prone to agency relations. Both of these differences are statistically significant at the 1 % level. The companies with an above median level of the votes-to-capital ratio have a ratio higher than 1.12 and 1.15 for the full sample and the sphere sub-sample respectively. The sub-sample of pure companies shows smaller differences between the premium means of the two votes-to-capital groups. The difference is only 3.5 percentage points and it is only significant at the 10 % level. The pure companies tend to have a lower differentiation between the percentage of votes and the percentage of capital. The cutoff point between above and below median for the pure company sub-sample is only 1.02.

	1981-2004
Panel A: Swedish all companies	
Low ownership concentration (deviation from mean premiums)	-0.027 (77)
High ownership concentration (deviation from mean premiums)	0.027 (77)
Difference in premiums between high and low OCON	0.054
Panel B: British all companies	
Low ownership concentration (deviation from mean premiums)	0.012** (199)
High ownership concentration (deviation from mean premiums)	-0.012* (199)
Difference in premiums between high and low OCON	-0.024***
Panel C: Swedish sphere companies	
Low ownership concentration (deviation from mean premiums)	-0.030 (68)
High ownership concentration (deviation from mean premiums)	0.029 (69)
Difference in premiums between high and low OCON	0.059
Panel D: Swedish pure companies	
Low ownership concentration (deviation from mean premiums)	-0.026 (40)
High ownership concentration (deviation from mean premiums)	0.025 (41)
Difference in premiums between high and low OCON	0.051

Table 8.3: Tests of deviations from time period specific mean premiums and differences on mean premiums depending on whether the observation has an ownership concentration above or below the median for that (sub-)sample for the 1981-2004. Ownership concentration is measured as the percentage of capital held by the largest shareholder ($OCON_2$). One sided t-test are performed. * indicates ten percent significance level, ** indicates a five percent significance level and *** indicates a one percent significance level.

As a construct the votes-to-capital ratio could ex ante be expected to be the strongest measure of a situation where agency situations are present. A comparatively low level of contributed capital combined with a formal control situation where the largest shareholder has the power to substantially influence decisions are expected to generate agency effects. This case is expected to generate more negative premiums.

The means of the percentage of votes and the percentage of capital for the high level of the votes-to-capital ratio exhibit somewhat different patterns for the full sample and the sub-samples. For the full sample both the means of the percentage of votes and the percentage of capital provided for the high votes-to-capital group are substantially different from the means of the total full sample. The percentage of votes is 4.5 percentage points higher and the percentage of capital is 3.1 percentage points lower than the full sample means. For the sphere sample situation the impact on the percentage of votes is much smaller, only adding 2.3 percentage points, while the percentage of capital is 4.9 percentage points lower.

	1981-2004
Panel A: Swedish all companies	
Low ownership concentration (deviation from mean premiums)	0.041** (76)
High ownership concentration (deviation from mean premiums)	-0.039*** (78)
Difference in premiums between high and low OCON	-0.080***
Panel B: Swedish sphere companies	
Low ownership concentration (deviation from mean premiums)	0.045** (69)
High ownership concentration (deviation from mean premiums)	-0.045*** (68)
Difference in premiums between high and low OCON	-0.090***
Panel C: Swedish pure companies	
Low ownership concentration (deviation from mean premiums)	0.017** (41)
High ownership concentration (deviation from mean premiums)	-0.018* (40)
Difference in premiums between high and low OCON	-0.035*

Table 8.4: Tests of deviations from time period specific mean premiums and differences on mean premiums depending on whether the observation has an ownership concentration above or below the median for that (sub-)sample for 1981-2004 time period. Ownership concentration is measured as the votes-to-capital ratio for the shares held by the largest shareholder ($OCON_1$). One sided t-test are performed.* indicates ten percent significance level, ** indicates a five percent significance level and *** indicates a one percent significance level.

Finally, the pure company sample shows increases in both means, 2.5 percentage points for the percentage of votes and 2.1 percentage points for the percentage of capital provided. This suggests that the strongest premium effects that were found for the sphere sub-sample is mainly driven by decreases in the percentage of capital provided. This finding is well in line with the agency predictions which suggest that less of the agency costs are absorbed by the largest shareholder, while the benefits accrue to that individual/group. This is further substantiated with the opposite results for the percentage of capital provided for the pure company sub-sample.

The Swedish investors appear to be satisfied with strong ownership and particularly so if strong ownership is combined with a situation where the largest owners absorb a comparatively large proportion of financial responsibility. Of course as suggested in the literature, in this situation the agency costs incurred are to a larger extent carried by the largest owner and the loss to the minority shareholders is much smaller. The positive impact of control combined with responsibility seems to dominate the negative impact due to the agency situation. In this case the British findings are even more contradictory to the Swedish findings. Since there is no difference in the sample between the two constructs of ownership concentration, it is impossible to derive whether percentage of votes or capital is the attribute that drives the result. It can be argued that due to the theoretical framework being used here, it is tempting to interpret the results in the context of the percentage of votes since then it is compatible with agency theory. In that case, the suggested increase in financial responsibility is completely dominated by the control arguments, in contrast to the Swedish findings where the percentage of votes and capital are less related.

So far the analysis has been conditioned on the situation that the agency costs are independent of the actions of the largest shareholder in terms of exercising power. The next section focuses on an attempt to capture the difference between formal power and controlling power and its effects premiums.

8.1.1.3 Portfolio diversification and ownership structure – an integrated approach

The examination of portfolio diversification and ownership structure above has been done separately, implicitly assuming that the two concepts are non-related. From a conceptual point of view, power can be seen from two perspectives, formal power and controlling power. Power is exercised if an individual owner or a group of owners have formal control over a company and when the control is used in some way to extract private benefits. Controlling power captures a special case of these private benefits, i.e. when the investment company is used to control other companies.

High levels of portfolio concentration can be observed due to at least two reasons. First, high portfolio concentration may be an effect of actions taken as a result of positive information regarding the future prospects of some securities. Second, a concentrated portfolio of securities may be an effect of trying to own as large a proportion of shares in another firm as possible given the available resources.

An investment company that exercises power over other companies may be value enhancing from the investment company perspective. If the management team of the investment company manages the influential position of the other companies well and in line with the overall objectives of the investors of the investment company, it is value creating. Stated differently, not only may a focused portfolio strategy be value beneficial due to a higher degree of transparency, but it may also be an indication of actions taken by the management due to private information.

When the ownership structure of the investment company is very concentrated, i.e. when a clearly identifiable dominant shareholder is present, the situation becomes very different. The concentrated portfolio of securities may then be perceived as an indication of controlling power from the owners of the investment company. The owners of the investment company are then seen as using their power in the investment company to control other companies, potentially in contrast to the intentions of the minority shareholders. This is a different kind of agency costs incurred that only accrue to the non-influential shareholders. These agency costs could be classified as additional risk born by the non-influential shareholders. From a premium perspective, the result would be that high portfolio concentration may exhibit very different premium levels depending on the level of ownership concentration. The available situations for the shareholders and the premium predictions are represented in table 8.5.

	Low portfolio concentration	**High portfolio concentration**
Low ownership concentration	Above or at mean premiums	Strongly above mean premiums
High ownership concentration	Below mean premiums	Strongly below mean premiums

Table 8.5: Classification structure and hypotheses for premiums based on ownership structure and portfolio concentration

An examination of the deviations in premiums from the overall mean premiums based on the structure in table 8.5 is performed to analyze the combined effect from the two measures on premiums. The examinations of deviations in mean premiums are made for all three measures of ownership concentration. Tables 8.6 through 8.9 show the levels of the deviations. Significance levels are reported for the deviations using one sided t-tests according to the hypotheses in table 8.5. Additionally, t-tests are performed for the differences in means between the high portfolio/low ownership and high portfolio/high ownership concentration premiums and between the low portfolio/high ownership and high portfolio/high ownership concentration premiums.

The results from the cases when ownership concentration is measured as either percentage of votes or percentage of capital are contradictory to the hypothesized premiums levels as shown in table 8.6 and 8.7. Companies with high levels of portfolio concentration have higher premiums in general.

The high portfolio/high ownership concentration groups appear to have less negative premiums than the other groups. This finding is particularly strong for the percentage of capital held by the largest investor as a measure of ownership concentration. The only exception to this finding is identified for pure Swedish companies. In this case, the high portfolio/high ownership concentration group shows almost identical premium levels as the high portfolio/low ownership concentration group for both measures.

	Low portfolio concentration	High portfolio concentration
Panel A: Swedish all companies		
Low ownership concentration ($OCON_2$) (deviation from mean premiums)	-0.029 (50)	-0.023 (27)
High ownership concentration ($OCON_2$) (deviation from mean premiums)	-0.019 (27)	0.052 (50)
Given high $OCON_2$, high vs low PCON		0 071
Given high PCON, high vs low $OCON_2$		0.075
Panel B: Swedish sphere companies		
Low ownership concentration ($OCON_2$) (deviation from mean premiums)	-0.044 (46)	0.000 (22)
High ownership concentration ($OCON_2$) (deviation from mean premiums)	-0.030 (22)	0.056 (47)
Given high $OCON_2$, high vs low PCON		0 087
Given high PCON, high vs low $OCON_2$		0.057
Panel C: Swedish pure companies		
Low ownership concentration ($OCON_2$) (deviation from mean premiums)	-0.057 (27)	0.040* (13)
High ownership concentration ($OCON_2$) (deviation from mean premiums)	0.014 (13)	0.029 (28)
Given high $OCON_2$, high vs low PCON		0 015
Given high PCON, high vs low $OCON_2$		-0.011

Table 8.6: Tests of deviations from time period specific mean premiums and differences in mean discounts due to portfolio and ownership concentration on the Swedish sample. Ownership concentration is measured as the percentage of capital held by the largest investor ($OCON_2$). One sided t-tests are performed based on table 8.5. * indicates ten percent significance level, ** indicates a five percent significance level and *** indicates a one percent significance level.

Evidence is once again found in favor of strong ownership structures from a valuation perspective. This situation is even more emphasized when the investment company employs a focused investment strategy. One explanation for this could be the private information/good information processing ability discussed above. The difference in means is large ranging from 2.8 to 9.0 percentage points for the percentage of votes and 1.5 to 10.1 percentage points for the percentage of capital. This confirms the willingness from minority shareholders to provide capital to investment companies and to have faith in the actions of the investment company if the dominant shareholder takes sufficiently large financial responsibility.

	Low portfolio concentration	High portfolio concentration
Panel A: Swedish all companies		
Low ownership concentration ($OCON_3$) (deviation from mean premiums)	-0.035 (48)	0.018 (29)
High ownership concentration ($OCON_3$) (deviation from mean premiums)	-0.010 (29)	0.031 (48)
Given high $OCON_3$, high vs low PCON		0.040
Given high PCON, high vs low $OCON_3$		0.013
Panel B: Swedish sphere companies		
Low ownership concentration ($OCON_3$) (deviation from mean premiums)	-0.034 (43)	0.037* (26)
High ownership concentration ($OCON_3$) (deviation from mean premiums)	-0.050* (25)	0.040 (43)
Given high $OCON_3$, high vs low PCON		0.090
Given high PCON, high vs low $OCON_3$		0.003
Panel C: Swedish pure companies		
Low ownership concentration ($OCON_3$) (deviation from mean premiums)	-0.055 (26)	0.034* (14)
High ownership concentration ($OCON_3$) (deviation from mean premiums)	0.004 (14)	0.032 (27)
Given high $OCON_3$, high vs low PCON		0.028
Given high PCON, high vs low $OCON_3$		-0.002

Table 8.7: Tests of deviations from time period specific mean premiums and differences in mean discounts due to portfolio and ownership concentration on the Swedish sample. Ownership concentration is measured as the percentage of votes held by the largest investor ($OCON_3$). One sided t-tests are performed based on table 8.5. * indicates ten percent significance level, ** indicates a five percent significance level and *** indicates a one percent significance level.

As before the British sample uses the percentage of votes as the measure of ownership concentration. The findings from the individual effects are accentuated when the examination is further detailed using the portfolio concentration dimension for parts of the sample. The findings are found in table 8.8 below. The overall premium mean for the observations included in the tests is -0.124[171]. This is very close to levels found for the low portfolio/low ownership concentration group and for the low portfolio/high ownership concentration group. The other two groups show must larger

[171] This number has not been disclosed previously since the descriptive statistics are based on all available information.

deviations from the overall mean premium. The most negative premiums are found for the high portfolio/high ownership concentration group with a negative deviation of 2.7 percentage points. Furthermore, this is 5.7 percentage points more negative than the high portfolio/low ownership concentration group. Stated differently, the average impact from moving to a high ownership concentration situation when the investment company has a focused portfolio strategy is 5.7 percentage points.

	Low portfolio concentration	**High portfolio concentration**
Low ownership concentration ($OCON_3$) (deviation from median premiums)	-0.003 (108)	0.030*** (93)
High ownership concentration ($OCON_3$) (deviation from median premiums)	0.010 (92)	-0.027*** (108)
Given high $OCON_3$, high vs low PCON		-0.033**
Given high PCON, high vs low $OCON_3$		-0.057***

Table 8.8: Tests of deviations from time period specific median premiums and differences in mean discounts due to portfolio and ownership concentration on the British sample. Ownership concentration is measured as the percentage of votes held by the largest beneficial owner ($OCON_3$). One sided t-tests are performed based on table 8.5. * indicates ten percent significance level, ** indicates a five percent significance level and *** indicates a one percent significance level.

Even though the measure of ownership concentration is ex ante much weaker than the votes-to-capital measure that can be employed for the Swedish data, the difference here is strong. The high portfolio/high ownership concentration group shows statistically significant, more negative premiums than any of the other three groups. The high portfolio/high ownership concentration group shows a 5 % or stronger significance level. It should also be emphasized that the British sample is much more homogeneous with respect to ownership structure and that the legal limitations to both portfolio and ownership concentration are much stronger than in the Swedish case. Note also that the findings are much stronger than in the Swedish case for the same measure of ownership concentration. This holds both for the individual findings discussed previously and the more detailed findings discussed here. The British findings are consistent with the predictions obtained from agency theory and furthermore consistent with the expectation that high ownership concentration combined with high portfolio concentration brings more negative premiums than simple formal power does. In the terminology of this study, this is interpreted in terms of controlling power with negative value effects. Indications are found showing that individual investors perceive agency situations with substantial sophistication.

The votes-to-capital ratio provides the strongest evidence when the individual effects are examined above. As can be seen in table 8.9, this is also true using the detailed examination of premiums. The positive impact on premiums from a focused portfolio strategy when the ownership concentration is low is at least as strong for the Swedish (sub-)samples as it is for the British sample. When contrasting the premium levels for the high portfolio/low ownership concentration group with the premiums for the high portfolio/high ownership concentration group, the difference varies between 8.6 and 17.2 percentage points.

For the all company Swedish sample the negative premium for the high portfolio/high ownership concentration group is on average about three times the negative premium for the high portfolio/low ownership concentration group. For the sphere companies it is almost 2.5 times and for the pure companies about 1.8 times[172]. The difference between the groups is strongly significant for all (sub-)samples.

Faith in portfolio choices of the management seems to prevail for the scattered ownership structure companies. The expectations on availability of non-public information and/or analyzing capabilities are relatively speaking substantial. Despite this positive impact on premiums in this case, it should not be forgotten that the premium levels are still negative on average for all groups. The negative premiums of less than 10 percentage points are possible to explain by administrative expenses even though statistical analysis can not identify such relationships. Note also that the premium levels for the high portfolio/low ownership concentration groups for the British sample and the Swedish (sub-)samples are very similar. Premiums range from -0.075 to -0.121 for the Swedish companies. Premiums are -0.094 for the British companies. This is so despite the original substantial difference in premiums found between Swedish and British companies.

The low portfolio concentration groups and the high portfolio/high ownership concentration groups show very similar levels of negative premiums for all three Swedish (sub-)samples. In fact the low portfolio/high

[172] The premium level for the (sub-)samples for the high portfolio/low ownership concentration groups are -0.075, -0.108 and -0.121 for the all companies, sphere companies and the pure companies respectively.

ownership concentration groups exhibit more negative premiums than any of the other groups for the full sample and the sphere companies. None of these cases are significantly more negative than the high portfolio/high ownership concentration group premiums. These findings are not compatible to the findings for the British sample. The evidence suggests that investors in Swedish closed-end investment companies demand verifiable actions from the management that signals usage of the investment expertise they hopefully possess. Investors buy investment expertise and they punish companies that simply diversify independently of the ownership structure.

	Low portfolio concentration	**High portfolio concentration**
Panel A: Swedish all companies		
Low ownership concentration ($OCON_1$) (deviation from mean premiums)	-0.022 (44)	0.126*** (32)
High ownership concentration ($OCON_1$) (deviation from mean premiums)	-0.031 (33)	-0.046*** (45)
Given high $OCON_1$, high vs low PCON		-0.015
Given high PCON, high vs low $OCON_1$		-0.172***
Panel B: Swedish sphere companies		
Low ownership concentration ($OCON_1$) (deviation from mean premiums)	-0.019 (35)	0.110*** (34)
High ownership concentration ($OCON_1$) (deviation from mean premiums)	-0.061*** (33)	-0.031** (35)
Given high $OCON_1$, high vs low PCON		0.030
Given high PCON, high vs low $OCON_1$		-0.141***
Panel C: Swedish pure companies		
Low ownership concentration ($OCON_1$) (deviation from mean premiums)	-0.029 (24)	0.083*** (17)
High ownership concentration ($OCON_1$) (deviation from mean premiums)	-0.042*** (16)	-0.003 (24)
Given high $OCON_1$, high vs low PCON		0.039
Given high PCON, high vs low $OCON_1$		-0.086***

Table 8.9: Tests of deviations from time period specific mean premiums and differences in mean discounts due to portfolio and ownership concentration on the Swedish sample. Ownership concentration is measured as the votes-to-capital ratio for the largest investor ($OCON_1$). One sided t-tests are performed based on table 8.5. * indicates ten percent significance level, ** indicates a five percent significance level and *** indicates a one percent significance level.

As before the pure company sub-sample shows smaller differences in mean premiums. Despite that the significance levels of the results are compatible with results from the other (sub-)samples. The evidence from the British and the pure Swedish companies suggests that the impact of portfolio concentration and ownership structure is strong enough to influence companies even within groups of companies with quite homogeneous levels of these measures. The market appears to assign different value to different investment strategies and power structures within the companies.

8.1.2 Analyses based on regressions

Next, analyses of the relationship between portfolio concentration and ownership structure on the one hand and premiums on the other hand are conducted using regressions. The variables are included in the base regressions and the results have already been presented in sections 6.4.1.3 and 6.4.2.6. In chapters six and seven the focus of the presentation has been on these variables as control variables. In this part the analysis of the coefficient estimates are made as independent variables in relation to the cross-tabulations and the specific theoretical arguments from previous research. The votes-to-capital measure is the only measure of ownership used for the Swedish (sub-)samples in the regressions.

The relationship is now put to a stronger test based on a linear relationship between the included variables and premiums. Recall that three variables are included in the regressions. These are the pure portfolio concentration variable, the portfolio concentration variable multiplied with a dummy for the pre-1981 years and an interaction variable between the portfolio concentration and ownership concentration (controlling power, M). In the controlling power measure, ownership concentration is measured as percentage of votes for the largest beneficial owner (M_3) for the British sample and the votes-to-capital ratio (M_1) for the Swedish (sub-)samples The interaction variable is aimed at capturing both the effect from the formal power situation of increased ownership concentration and the difference between high portfolio/low ownership concentration group and the high portfolio/high ownership concentration group. The hypotheses for the coefficient estimates are as follows

- coefficient on portfolio concentration > 0
- coefficient on dummy * portfolio concentration < 0
- coefficient on controlling power < 0

The findings from the regressions, which are shown in table 8.10, are consistent with the results from the cross-tabulations above. All coefficients have the expected sign and in all but three cases they are statistically significant at the five percent level or higher. The three exceptions are the portfolio concentration for the British sample and the interaction term between ownership and portfolio concentration for the Swedish pure companies sub-sample (twice). These groups also show very weak results based on the mean premiums in the cross-tabulations above.

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel A: Firm-year observations December 1972 - December 2004				
Portfolio diversification (PCON)	0.209	N/A	0.471	0.291
	(2.359)**		(4.736)***	(2.882)***
Portfolio concentration (PCON) * year dummy	-0.238	N/A	-0.222	-0.226
	(-3.647)***		(-3.781)***	(-3.301)***
Votes-to-capital * portfolio concentration (M_1)	-0.124	N/A	-0.343	-0.119
	(-2.491)***		(-4.404)***	(-1.276)
Panel B: Firm-year observations July 1981 - December 2004				
Portfolio diversification (PCON)	0.218	0.083	0.465	0.282
	(2.476)***	(1.034)	(4.638)***	(2.779)***
Votes-to-capital * portfolio concentration (M_1)	-0.122		-0.326	-0.097
	(-2.586)'**		(-4.179)***	(-1.026)
Beneficial owner percentage * portfolio concentration (M_3)		-0.818		
		(-3.114)***		

Table 8.10: Coefficients on portfolio diversification and controlling power from the base regressions. All regressions are run using the specification in equation 6.2 (p. 161). One sided t-tests are performed based on hypotheses on page 226. * indicates ten percent significance level, ** indicates a five percent significance level and *** indicates a one percent significance level using White standard errors.

The marginal impact on premiums from changes in portfolio concentration and/or ownership concentration has to be analyzed carefully. The marginal impact from a change in portfolio concentration can be derived for the Swedish all firms as

$$\text{Marginal impact of PCON} = 0.209 - 0.238 - 0.124{*}\text{OCON} \tag{8.1}$$

if the we analyze the pre-1981 situation and

$$\text{Marginal impact of PCON} = 0.218 - 0.122{*}\text{OCON} \tag{8.2}$$

otherwise. The marginal impact from a change in OCON can similarly be derived for the pre-1981 situation as

$$\text{Marginal impact of OCON} = -\ 0.124{*}\ \text{PCON} \tag{8.3}$$

This may differ substantially from the total impact of a change in either of the two parameters if they are correlated. Table 8.11 shows the marginal impact on premiums from changes in portfolio and ownership concentration respectively. For the Swedish (sub-)samples the levels of 1 (panel A) and 2 (panel C) for the votes-to-capital ratio have been used. In all other cases, the mean levels of portfolio concentration for the full samples have been used as the benchmark.

	Swedish all companies	UK all companies	Swedish sphere companies	Swedish pure companies
Panel A: Firm year observation December 1972 – June 1981				
Portfolio concentration (PCON)	-0.153	N/A	-0.094	-0.054
Votes-to-capital ratio ($OCON_1$)	-0.059	N/A	-0.165	-0.057
Beneficial owner percentage of votes and capital ($OCON_3$)		N/A		
Panel B: Firm year observation July 1981 – December 2004				
Portfolio concentration (PCON)	0.096	-0.012	0.139	0.185
Votes-to-capital ratio ($OCON_1$)	-0.058		-0.156	-0.046
Beneficial owner percentage of votes and capital ($OCON_3$)		-0.123		
Panel C: Firm year observation July 1981 – December 2004				
Portfolio concentration (PCON)	-0.026	N/A	-0.187	0.088

Table 8.11: Marginal impacts on premiums from changes in portfolio and ownership concentration. The marginal impacts are based on coefficient estimates in table 8.10 and they are calculated according to equations 8.1 through 8.3, where OCON = 1 and PCON 0.480 for the Swedish (sub-)samples and OCON = 0.116 and PCON = 0.165 for the British sample. In panel C, OCON = 2.

For the pre-1981 period the Swedish data suggest that both portfolio and ownership concentration are negatively related to premiums. The ownership concentration issue affects the sphere companies most with a marginal impact of -0.165. This means that a closed-end investment company with a votes-to-capital ratio of 2 for the largest shareholder compared to a company with a votes-to-capital of 1 for the largest shareholder is expected to have a premium that is 16.5 percentage points more negative. This effect on premiums also holds for the 1981-2004 period. The premium effect for the overall Swedish sample and the pure companies is much lower, only about – 6 percentage points.

The negative effect on premiums from portfolio concentration for the early years is in sharp contrast to the 1981-2004 period. As shown in chapter five, the Swedish stock market was inactive and regulated prior to 1981. Individual investors did not regularly participate on the market. The number of open-end funds as a substitute to closed-end investment companies was small. Access to the stock market and thereby the possibility to obtain diversification could be obtained through the closed-end investment companies. If diversification was the target, increased portfolio concentration would be detrimental to the value of the company. This is what may be unfolded in the regressions parameters above.

The findings for the 1981-2004 period are almost identical for the ownership concentration effects, but completely reversed for the portfolio concentration effects. The increased access to the capital market by individual investor combined with the dramatic increase in the number of open-end funds changed the conditions for the closed-end investment companies in Sweden. No such changes have occurred on the British stock market. A focused portfolio strategy is no longer punished since diversification can readily be obtained from other sources. A focused portfolio strategy can now be seen as a strategy towards using investment expertise and size on the market to benefit from large well-analyzed transactions. A concentrated portfolio is then a sign of a value creating strategy.

The marginal impact on the Swedish companies ranges from 9.6 percentage points to 18.5 percentage points of a change in portfolio concentration. This means that a company with a well diversified portfolio where the three largest holdings are 10 % of the total portfolio have a premium that is 4.8 to 9.2 percentage points lower than a company where the three largest holdings are 60 % of the portfolio and the remaining 40 % is well-diversified. The impact is the largest for the pure companies. The British companies show a negative impact from portfolio concentration on premiums, but, from both a statistical and economic perspective, the impact is negligible. The portfolios in the British companies are generally less concentrated leaving the cut-off point, which is the median, to be much smaller. A possible explanation for the lack of significance in the British sample is that high levels of concentration are necessary to obtain a value impact. Strong diversification effects are obtained with about ten equally sized investments in different industries. This indicates that high concentration is necessary to signal a focused strategy.

The effect of different levels of ownership concentration on the marginal impact from portfolio concentration is substantial. When votes-to-capital ratio for the Swedish companies is set to 2 instead of 1, the marginal effect from portfolio concentration turns strongly negative for the sphere companies. For the full sample and the pure companies the impact approaches zero. The pre-designed sub-sample of companies exposed to strong owner groups, the sphere sub-sample, shows levels which suggest that large holdings in portfolio companies are perceived as value destructive. This is consistent with the differences in mean premiums identified using the cross-tabulations. Effectively, the regression results suggest that a company that is classified as a sphere company with a one share – one vote situation and a portfolio concentration of 0.6 has 20 percentage points higher premiums than a sphere company where the largest owner has two voting rights for every share that the largest owner holds. Noting that the average premium level for the sphere companies in the 1981 – 2004 selection is -0.212, the impact is substantial.

8.1.3 A reconciliation between portfolio concentration, controlling power and administrative expenses

The theoretical argument for why ownership concentration should matter is that the dominant shareholder has the opportunity to extract private benefits from the company. These benefits are generally perceived to be monetary though they do not necessarily have to be. Note that Jensen and Meckling (1976) claim that agency costs can be both pecuniary and non-pecuniary in nature. If the indicators for an agency situation used are valid, it can also be argued that these indicators should be related to administrative expenses, which is an indicator of pecuniary agency costs. Consequently, it should be possible to find differences in administrative expenses between those companies that have different levels of controlling power.

The initial results from the regressions presented in chapter six revealed a positive relationship between administrative expenses and premiums. This is counterintuitive unless these administrative expenses are proxies for something else. Potentially, the administrative expenses are made of two separate components, one of which is driven by agency costs. The agency cost component ought to be negatively correlated with premiums. The other component may have a different relationship with premiums if empirically the statistical model is not completely specified and the remaining administrative expenses are correlated with some omitted variable.

In order to study if there is a proportion of administrative expenses that can be classified as agency costs, a direct estimate of that proportion has to be obtained. Alternatively, an estimate of normal administrative expenses must be obtained where the supernormal expenses are then classified as agency costs. The former approach is used here in two steps. First the mean administrative expenses are examined for the low versus high ownership concentration groups. The difference in mean administrative expenses is also examined within the high portfolio concentration group for companies with low and high ownership concentration respectively. Second, regressions are run in two stages. First the administrative expenses are regressed on portfolio concentration and controlling power. This is done in order to obtain a direct measure of the agency cost from the predicted administrative expenses due to the two variables. Thereafter, both the predicted value of administrative expenses and the residual are included in the original regression without control variables instead of the total administrative expenses variable.

Tables 8.12 and 8.13 show the mean administrative expenses for the ownership and portfolio concentration groups and interaction between the groups respectively. Recall from above that premiums were strongly affected by ownership concentration for the Swedish sphere sample and to a certain extent for the British companies.

The remaining Swedish (sub-)samples showed smaller effects. The same pattern holds for the administrative expenses. Within the Swedish sphere sub-sample the increase in mean administrative expenses from the low ownership concentration group to the high ownership concentration group is 84 %. This is the only significant difference. The Swedish pure companies show no effect on expenses while the effect for the Swedish total sample and the British sample is between 13 and 19 %. The findings are weakly supportive of the predictions from agency theory, since the management team and/or majority shareholders may obtain pecuniary benefits from their position which the minority shareholders can not control.

	Swedish all companies	UK all companies	Swedish sphere companies	Swedish pure companies
Low ownership concentration	0.0036	0.0090	0.0025	0.0033
High ownership concentration	0.0043	0.0102	0.0046	0.0033
Percentage difference	19.4 %	13.3 %	84.0 % ***	0.0 %
Low portfolio concentration	0.0044	0.0086	0.0036	0.0035
High portfolio concentration	0.0036	0.0107	0.0035	0.0030
Percentage difference	-18.2 %	24.4 %	-2.8 %	-14.3 %

Table 8.12: Mean yearly administrative expenses scaled by beginning of period net asset value for groups according to the portfolio and ownership concentration. One sided t-test for the difference in administrative expenses. * indicates ten percent significance level, ** indicates a five percent significance level and *** indicates a one percent significance level.

The portfolio concentration as the explanation for differences in administrative expenses exhibits a much more unstable pattern. The British companies show strong evidence in favor of an increased level of administrative expenses for companies with a concentrated portfolio to the companies with a more diversified portfolio. A closer examination of the data reveals that observations from two companies provide about one-third of the increase in administrative expenses for the high portfolio concentration groups[173]. In the Swedish case, high portfolio concentration drives lower levels of administrative expenses.

Table 8.13 shows the levels of administrative expenses for the four groups based on the interaction between the level of portfolio and ownership

[173] The two companies are the International Biotechnology Trust and the Candover Trust.

concentration. Significantly different administrative expenses between any groups are only found for the sphere companies in accordance with the findings from table 8.12. For the British companies there is a high but insignificant level of administrative expenses for the high portfolio/high ownership concentration group for the British companies.

	Low portfolio concentration	High portfolio concentration
Panel A: Swedish all companies		
Low ownership concentration	0.0040	0.0031
High ownership concentration	0.0049	0.0039
Difference in expenses within the PCON groups	0.0009	0.0008
Difference in expenses within the high OCON group		-0.0010
Panel B: British all companies		
Low ownership concentration	0.0088	0.0093
High ownership concentration	0.0082	0.0120
Difference in expenses within the PCON groups	-0.0006	0.0027
Difference in expenses within the high OCON group		0.0038
Panel C: Swedish sphere companies		
Low ownership concentration	0.0025	0.0029
High ownership concentration	0.0050	0.0043
Difference in expenses within the PCON groups	0.0025***	0.0014**
Difference in expenses within the high OCON group		-0.0007
Panel D: Swedish pure companies		
Low ownership concentration	0.0036	0.0026
High ownership concentration	0.0033	0.0035
Difference in expenses within the PCON groups	-0.0003	0.0009
Difference in expenses within the high OCON group		0.0002

Table 8.13: Mean yearly administrative expenses scaled by beginning of period net asset value for groups according to the portfolio and ownership concentration. One sided t-test for the difference in administrative expenses within the PCON groups and within the high OCON group. * indicates ten percent significance level, ** indicates a five percent significance level and *** indicates a one percent significance level.

The different levels of portfolio concentration in the British and the Swedish samples may indicate that there is a non-linear relationship between administrative expenses and portfolio concentration. Strongly concentrated portfolios may be associated with lower administrative expenses while the relationship in the mid-range is positive. Table 8.14 shows the levels of portfolio concentration for the four groups based on portfolio and ownership concentration. For the Swedish sample, it is clear that the level of portfolio concentration is much higher for the low ownership concentration companies than for the high ownership concentration companies. The reversed situation holds for the British companies. The Swedish companies have moved into the extreme positions where only a few large holdings combine to 70 – 75 % of the total portfolio of portfolio securities for the low ownership concentration firms. These high levels of portfolio concentration potentially gives the owner controlled management team substantial influence over the portfolio companies. Control can be considered another kind of private benefits than administrative expenses with proprietary features. Administrative expenses can only be diverted to the non-influential shareholders to a small extent.

	Low portfolio concentration	**High portfolio concentration**
Panel A: Swedish all companies		
Low ownership Concentration	0.266	0.706
High ownership Concentration	0.314	0.586
Panel B: British all companies		
Low ownership Concentration	0.088	0.194
High ownership Concentration	0.086	0.279
Panel C: Swedish sphere companies		
Low ownership Concentration	0.291	0.722
High ownership Concentration	0.327	0.583
Panel D: Swedish pure companies		
Low ownership Concentration	0.252	0.730
High ownership Concentration	0.302	0.575

Table 8.14 Level of portfolio concentration for the ownership/portfolio concentration groups

The identified relationship between administrative expenses and portfolio and ownership concentration turns the attention to the impact of the different parts of the administrative expenses on premiums. In order to capture the interrelationships between the portfolio and ownership concentration variables, administrative expenses have been regressed on the portfolio concentration variable and the controlling power variables.

Table 8.15 shows the regression results. The findings are consistent with the results above. The full Swedish sample shows a negative relationship between portfolio concentration and premiums and a positive relationship between the interaction variable and premiums. Both coefficients are strongly significant but the explanatory power is quite low.

In the British case the coefficient signs are reversed. The positive coefficient for portfolio concentration verifies the results from above but the coefficient on the interaction variable is insignificant. The ownership concentration measured as the percentage of votes/capital can not identify any agency costs measured as levels of administrative expenses. The positive sign on portfolio concentration further suggests the case of non-linearities in the effect on premiums from this variable.

	Swedish all companies	UK all companies	Swedish sphere companies	Swedish pure companies
Portfolio concentration (PCON)	-0.004***	0.026***	-0.009***	-0.013***
Votes-to-capital * portfolio concentration (M_1)	0.002***		0.008***	0.009***
Beneficial owner percentage * portfolio concentration (M_3)		-0.027		
Adjusted R-squared	0.047	0.103	0.286	0.178***

Table 8.15: Coefficients and explanatory power when administrative expenses are regressed on portfolio concentration and portfolio concentration*ownership concentration

The Swedish (sub-)samples show results that are similar to the full sample with varying degrees of explanatory power and coefficient levels. All coefficients on the portfolio concentration variable are negative, while the coefficients on the controlling power variable are positive. All coefficients are significant. Both the sphere and the pure company sub-samples show high explanatory power and the expected signs on the coefficients. However, a closer examination of the coefficients reveals that if the closed-end investment company has a votes-to-capital of 1, there is hardly any impact from portfolio concentration on administrative expenses[174]. The previously used base case of portfolio concentration, 0.48, and the votes-to-capital, 2, brings an increased level of administrative expenses for the sphere and pure companies of 0.34 % and 0.24 % of net asset value annually[175]. According to the tables in chapter three and assuming an required rate of return on net assets of 9 % and a growth rate of 4 %, this implies more negative premiums of about five to seven percentage points. This implied difference in premiums is solely due to the increase in the votes-to-capital ratio.

This impact on premiums is empirically tested by running the original return regressions from chapter six, but exchanging the original administrative expenses for the estimated value and the residuals from the regressions of administrative expenses on portfolio and ownership concentration. The estimated values are seen as measures of agency costs and the residual is other administrative expenses.

Table 8.16 shows the results from these regressions. Three strong results can be found;

- the explanatory power from these regressions is considerably higher than when pure administrative expenses are included and only marginally lower than when the control variables are directly included;
- the coefficients on the estimated values are negative as originally expected for administrative expenses; and
- the coefficient levels for the Swedish sphere and pure company sub-samples are in line with the theoretical expectations, e.g. Jensen and Meckling (1976)

The British sample shows no significant coefficients which could be expected given the findings from the regressions above and the cross-tabulations. The impact on the explanatory power is also small. Despite the insignificance the signs of the coefficients are as expected. It is worth noting that the coefficient levels are lower than for the Swedish (sub-)samples.

The full Swedish sample shows very low coefficients in the regressions displayed in table 8.15. When it comes to the predicted value, this is

[174] For example, for the Swedish sphere companies this is obtained by taking -0.009 + 0.008*OCON and when OCON = 1, this is -0.001.

[175] This is obtained by taking -0.009*0.48 + 0.008*2*0.48 = 0.00336 and -0.013*0.48 + 0.009*2*0.48 = 0.0024 respectively.

compensated by a high level of that coefficient, see table 8.16. The coefficient of the unexplained administrative expenses is similar to what is found for the other Swedish sub-samples. The explanatory power shows that almost all of the information in the controls can be channeled through administrative expenses.

	Swedish all companies	UK all companies	Swedish sphere companies	Swedish pure companies
Panel A: Firm year observation December 1972 – December 2004				
Predicted administrative expenses	-53.036**		-22.474***	-21.643***
Unexplained administrative expenses	9.691***		15.552***	9.474***
Adjusted R-squared from regressions with controls	0.309		0.424	0.386
Adjusted R-squared from regressions without controls matched samples	0.239		0.264	0.138
Adjusted R-squared current regressions	0.309		0.386	0.297
Panel B: Firm year observation July 1981 – December 2004				
Predicted administrative expenses	-55.544**	-2.967	-22.726***	-20.807***
Unexplained administrative expenses	8.616***	1.122	14.469***	9.805***
Adjusted R-squared from regressions with controls	0.342	0.092	0.456	0.386
Adjusted R-squared from regressions without controls matched samples	0.276	0.069	0.305	0.195
Adjusted R-squared current regressions	0.343	0.072	0.424	0.367

Table 8.16: Coefficients and explanatory power for the estimated values and the residuals from the regressions of administrative expenses on portfolio and ownership concentration are inserted into the original return regressions without control variables. One sided t-test are performed for the coefficient on the predicted values and a double sided t-test for the unexplained administrative expenses * indicates ten percent significance level, ** indicates a five percent significance level and *** indicates a one percent significance level using White standard errors.

The Swedish sphere and pure company sub-samples exhibit promising results. The coefficients on the estimated value are close to -20. This is an expected coefficient level assuming a constant proportion of net asset value being agency costs, underlying growth and required rate of return[176]. The unexplained administrative expenses show lower coefficients, which is an indication of lower persistence. The positive sign of the coefficient on unexplained administrative expenses is consistent with the discussion in section 7.1 regarding performance and administrative expenses. Moreover, the high explanatory power due to the portfolio concentration and controlling power variables is to a large extent related to future potential agency costs and benefits from a focused portfolio strategy when ownership concentration is low.

8.1.4 Concluding comments and previous research

Sections 8.1.1 to 8.1.3 has provided evidence which links two conceptual categories to the premiums on closed-end investment companies, divergence of opinion/heterogeneous beliefs and agency costs/problems. The concept of divergence of opinion is related to investor sentiment. However, the approach employed here is somewhat different from the generally used approach in investor sentiment studies. Previous research has focused on relationships between closed-end investment company premiums and small-firm indices and January effects (Lee, Shleifer and Thaler, 1991; Brauer and Chang, 1990), redemptions in open-end investment companies (Lee, Shleifer and Thaler, 1991) and difference between individual and institutional investors based on reactions to changes or information processing abilities (Grullon and Wang, 2001; Sias, 1997). The results in all of those studies have confirmed the presence of some kind of investor sentiment.

The approach taken here is concerned with individual investors' perceptions of the value of individual shares. This is a more limited approach to the concept of investor sentiment, but it does not exclude a general bias within the individual investor community towards certain shares. The findings support such a kind of investor sentiment with a positive impact from portfolio concentration. The measure is seen to be an indication of the probability of unwanted shares by the individual investors in the portfolio of the closed-end investment company. The measure employed in this study, the level of portfolio concentration in quoted securities, is admittedly a rough measure. The measure can also be interpreted as a twist on the

[176] Growth is expected to be 4 % and the required rate of return 9 %. In the framework of chapter three, this implies a λ of 1.04.

proposed information processing abilities by Grullon and Wang (2001). The individual investors want to be able to benefit from the excess ability held by institutional investors, which the management of the closed-end investment company can expected to have, but they prefer a focused strategy where the best investments are invested in instead of investing in a more widely diversified portfolio with diminishing returns despite the processing ability.

The effects of agency relations have been given substantial support in the findings of the current study. The mean premiums levels are much more negative for companies where agency problems are expected. The findings hold for both the Swedish and the British case. The early findings on these matters are directed towards the level of administrative expenses and their relationship to premiums. Empirical evidence in support of administrative expenses as explanations for negative premiums has been weak to say the least (Boudreaux, 1973; Malkiel, 1977 and 1995). Later, Kumar and Norohna (1992) have given some empirical support when administrative expenses are scaled on a flow variable, in their case dividends and administrative expenses. Despite the empirical situation the theoretical and semi-empirical evidence continue to argue for a relationship (e.g. Ross, 2002).

Another aspect of the agency situation is based on the lack of liquidation and thereby staleness in actions from the minorities perspective. Draper (1989), Thompson (1978), Brauer (1984) and others have all provided strong evidence suggesting that managerial holdings in the closed-end investment company is negatively related to open-ending or liquidation. This is so even if it appears that a liquidation of the company would have been profitable for the owners. Barclay et al. (1995) provided evidence of a negative relationship between premiums and ownership concentration. However, all of these studies have provided evidence of a relationship to premiums that is not directly linked to any core economic explanations for the premiums. No reconciliation of administrative expenses or similar issues has been presented. Del Guercio et al. (2003) showed that director independence was related to low levels of administrative expenses. The present study has shown that ownership concentration has substantial negative impact on premiums. The findings are even stronger when shares with different voting rights are used. Moreover, the controlling power, i.e. when ownership and portfolio concentrations are simultaneously high, has very large negative impact on premiums.

It has also been shown that administrative expenses are related to both ownership (negatively) and portfolio (negatively) concentration, at least for higher levels of the two concentration variables. The present study has also shown that the expenses resulting from the concentration variables are negatively related to premiums while the remaining part still shows a positive relationship with premiums.

8.2 Pricing of asset risk from a heterogeneous beliefs and agency perspective

So far the analyses have been directed towards shares as the primary asset in the portfolio of the closed-end investment company. The original valuation model was designed to focus on the existence of a market price on the portfolio assets. Another relevant focus is the kind of and level of risk in the securities. The level of risk is directly related to the impact of the heterogeneous beliefs arguments discussed above.

Closed-end investment companies may invest in fixed interest instruments without any specified limitations in the legal regulations in excess of the general diversification arguments. The company's self-defined statutes may certainly prohibit such investments, but no industry-wide limitations apply. Swedish closed-end investment companies have only made marginal investments in fixed interest instruments. The British counterparts have to a much larger extent used such instruments to varying degrees both cross-sectionally and over time. Despite this, no companies investing exclusively in bonds exist.

The main differences between fixed instruments and equity are that the cash flow streams generated by the asset are guaranteed (unless bankruptcy occurs) and the security generally has a limited life with a guaranteed final repayment of the nominal value. The fixed cash flow streams mean that as long as the investor holds the security to maturity all cash flow streams are determined. From the issuing date to the maturity date the value of the asset may fluctuate dependent on market interest rates. Generally the systematic risk in these instruments is much lower than for equity instruments. Moreover, no formal control over the portfolio companies can be exercised. Finally, less timing risk is expected due to smaller fluctuations in prices of these instruments compared to equity instruments. The result is a less risky investment portfolio both from a traditional finance perspective and from an agency perspective[177].

From a premium perspective these characteristics of the fixed interest instruments are expected to have effects if the analysis is widened to capture the divergence of opinion and agency perspectives. As long as the fixed interest instruments are included in net asset value at market value, it is expected that the proportion of fixed interest instruments has a positive impact on premiums compared to an all equity portfolio of securities. From the divergence of opinion perspective less disagreement in the valuation process generates less divergence on the accurate price. Effectively no additional risk or cash flow adjustments are made and prices are higher. From an agency perspective, no controlling power exists over the portfolio companies. The risk is less for a situation where management or large owners have divergent agendas from the non-influential shareholders.

In order to investigate this proposed relationship between fixed interest instruments and premiums, the proportion of such instruments to net asset value has been calculated for each company. Since the Swedish companies do not use these instruments to invest in to any reasonable extent, the British sample is used as the only source of information to test the hypothesis. The proportion of fixed interest instruments to net asset value is added to the base regressions. The results from the new regressions are reported in table 8.17.

Before analyzing the specific impact from fixed interest securities, it should be noted that no material changes occur for the coefficients and significance levels of the original return based variables or control variables. The coefficient on the proportion of fixed interest securities is positive and strongly significant for all time periods. This is in line with the limited risk incurred by minority shareholders due to management/majority shareholder disposition of the assets. The significance is somewhat lower when the control variables are included in the model, but it remains at the three percent level. A closer examination of the coefficient level reveals some strong evidence for the impact on premiums. Note that the variable may take on values continuously between 0 and 1. This means that closed-end investment companies on average that are fully invested in fixed interest

[177] Another situation may occur if the company invests in junk bonds, but that situation is not examined here specifically.

securities could have a premium that is 11.0 to 12.0 % higher than a closed-end investment company that is fully invested in shares.

	UK all companies
Panel A: Firm year observation July 1981 – December 2004 without controls	
Coefficient on proportion of fixed interest instrument	0.110***
Regression intercept	-0.144
Adjusted R-squared from original regression	0.070
Adjusted R-squared from current regression	0.138
Panel B: Firm year observation July 1998 – December 2004 with controls	
Coefficient on proportion of fixed interest instrument	0.120**
Regression intercept	-0.139
Adjusted R-squared from original regression	0.092
Adjusted R-squared from current regression	0.132

Table 8.17: Coefficients and explanatory power for the proportion of fixed interest instruments using the original return regression. One sided t-test are performed * indicates ten percent significance level, ** indicates a five percent significance level and *** indicates a one percent significance level using White standard errors.

The intercepts from the models range from -13.9 % to -16.5 % and the impact from taxes and administrative expenses is fairly small. These observations mean that the negative premium may be almost entirely eliminated by exclusively investing in fixed interest securities. This is strong evidence in favor of the hypotheses based on divergence of opinion and agency predictions. The low levels of explanatory power for the regression as a whole still shows that the cross-sectional and time-series variation can not be sufficiently explained. Despite that the mean level of the premiums appears to be strongly related to portfolio composition.

8.2.1 Concluding comments and previous research

Less divergence of opinion is expected for interest bearing financial assets since the future cash flows are predetermined. As a result the negative impact discussed previously with respect to portfolio diversification of shares is not present here. On the contrary, more interest bearing financial assets would reduce negative premiums relative to a portfolio of equity instruments. This is consistent with the findings presented above on British data.

No European evidence has been found that focuses on the proportion of low risk assets or as in this case fixed interest securities. Pure bond companies do not exist in either Sweden or Great Britain. In the US, the closed-end bond funds are the largest group of closed-end funds[178]. Evidence from the American market shows that bond funds are traded at premiums very close to zero and this observation is consistent over time. An example is that Abraham et al. (1993) show that American bond funds on average traded at a 1 % positive premium during 1985 through 1989. Here, it has been shown that also partial allocation of the portfolio of securities to fixed interest securities has effects on premiums.

In addition to the findings on pure portfolio/ownership concentration the evidence based on the risk level of the asset in the portfolio can be used to understand differences in the premium levels internationally. Note also that the explanation for the findings presented here is based on the faith or distrust in the management team from the minority shareholders with no real influence. These are factors that are not readily observable as ordinary economic explanations.

[178] Recall that closed-end funds are the American expression for the companies that here are called closed-end investment companies.

9 Summary and concluding remarks

In this final chapter, the objective, design and results regarding the undertaken study are first summarized. Then the discussion proceeds to focus on findings based on the following key issues:

- What can be studied given the research design?
- What problems occur given the mixed set of explanations used?
- How well do the operationalizations relate to the underlying concepts and what are the implications of the choices?
- Which alternative explanations can be considered within the current framework and the chosen operationalizations?

The study and the findings are summarized in section 9.1. The findings are discussed in the context of the purpose and the background of the study in section 9.2. The limitations of the research design and mix of explanations used are discussed in section 9.3. The match between the operationalizations and the concepts in the context of alternative explanations are discussed in section 9.4. Section 9.5 contains some closing remarks on the limitations of the study and suggestions for other explanations.

9.1 Summary of the study

This study of premiums on closed-end investment companies has its origin in three related observations. First, such premiums exist on many capital markets and they appear to be persistent and substantial. These characteristics are on the surface anomalous. Second, researchers have tried to find explanations for the premiums for about half a century. Many explanations have been suggested but few of them have been empirically viable. Third, most previous research has been conducted using American data. Since the phenomenon prevails on many capital markets an examination of the premiums in a European context is of interest.

9.1.1 The theoretical framework and empirical tests

This study takes its theoretical starting point in the residual income valuation model. First, the residual earnings generation process is adjusted to fit the special characteristics of the closed-end investment companies. The adjusted model is shown below.

$$\begin{aligned}\text{Premium}_0 = &\sum_{t=1}^{H}\left[\left(\prod_{\tau=1}^{t}(1+r_{E,\tau})\right)^{-1}\times E_0\left[(\text{RNAV}_t - r_{E,t})\times\tilde{G}_{t-1}\right]+\right.\\ &\left.+E_0[\text{Premium}_H]\times\tilde{G}_H\times\left(\prod_{\tau=1}^{H}(1+r_{E,\tau})\right)^{-1}\right]\end{aligned} \quad (3.4)$$

and

$$\text{RNAV}_t - r_{E,t} = \text{RRC}_{nqs,t} + \text{RRC}_{nus,t} + \text{RRC}_{nfl,t} + \text{RRC}_{adm,t} + \text{RRC}_{tax,t} + \text{EAE}_t$$

where

$r_{E,t}$ = the required rate of return on equity in period t

$\text{RRC}_{nqs,t}$ = residual return contribution from net quoted securities in period t

$\text{RRC}_{nus,t}$ = residual return contribution from net unquoted securities in period t

$\text{RRC}_{nfl,t}$ = residual return contribution from net financial liabilities in period t

$\text{RRC}_{adm,t}$ = residual return contribution from administrative expenses in period t

$\text{RRC}_{tax,t}$ = residual return contribution from taxes in period t

EAE_t = extended aggregation error in period t

G_t = cumulative growth rate in net asset value from time 0 to time t

Based on the theoretical framework, four regression models are developed, which are used in statistical tests. The tests use both net asset value residual return contributions and residual return contributions based on quoted and unquoted securities separately as primary drivers for premiums.

A peculiarity of the empirical research design relative to the theoretical model is that two of the regression models are amended with variables that capture the role of diversification and ownership structure. First, the value impact of diversification is based on the concept of heterogeneous beliefs and its impact on prices as described by Miller (1977). Second, the ownership structure is argued to affect prices due to the agency situation that may occur with a dominant shareholder and many non-influential shareholders. In the present study a concept of controlling power is also introduced. This is meant to capture a difference between formal power and the case when the formal power is actually used particularly to control toher companies. The agency arguments are based on Jensen and Meckling (1976). The following four regressions are estimated:

$$\begin{aligned}\text{Premium}_0 &= \alpha + \beta_{nav,1}\text{RRC}^{\text{eat}}_{\text{nav},1} + \beta_{nav,histl}\text{RRC}^{\text{eat}}_{\text{nav,hist}} + \beta_{nav,histc}\left(\text{RRC}^{\text{eat}}_{\text{hist,t}}\right)^3 + \\ &+ \beta_{adm,1}\text{RRC}_{\text{adm},1} + \beta_{tax,1}\text{RRC}_{\text{tax},1} + \varepsilon\end{aligned} \tag{6.1}$$

$$\begin{aligned}\text{Premium}_0 &= \alpha + \beta_{nus,1}\text{RRC}_{\text{nus},1} + \beta_{nus,hist}\text{RRC}_{\text{nus,hist}} + \beta_{nus,histc}\left(\text{RRC}_{\text{nus,hist}}\right)^3 + \\ &+ \beta_{nqs,hist}\text{RRC}_{\text{nqs,hist}} + \beta_{adm,1}\text{RRC}_{\text{adm},1} + \beta_{tax,1}\text{RRC}_{\text{tax},1} + \varepsilon\end{aligned} \tag{6.2}$$

$$\begin{aligned}\text{Premium}_0 &= \alpha + \beta_{nav,1}\text{RRC}^{\text{eat}}_{\text{nav},1} + \beta_{nav,histl}\text{RRC}^{\text{eat}}_{\text{nav,hist}} + \beta_{nav,histc}\left(\text{RRC}^{\text{eat}}_{\text{hist,t}}\right)^3 + \\ &+ \beta_{adm,1}\text{RRC}_{\text{adm},1} + \beta_{tax,1}\text{RRC}_{\text{tax},1} + \beta_{PCON}\text{PCON}_0 + \\ &+ \beta_{PCONDum}\text{PCON}_0 \times \text{Dum} + \beta_M \text{M}_0 + \varepsilon\end{aligned} \tag{6.3}$$

$$\begin{aligned}\text{Premium}_0 &= \alpha + \beta_{nus,1}\text{RRC}_{\text{nus},1} + \beta_{nus,hist}\text{RRC}_{\text{nus,hist}} + \beta_{nus,histc}\left(\text{RRC}_{\text{nus,hist}}\right)^3 + \\ &+ \beta_{nqs,hist}\text{RRC}_{\text{nqs,hist}} + \beta_{adm,1}\text{RRC}_{\text{adm},1} + \beta_{tax,1}\text{RRC}_{\text{tax},1} + \\ &+ \beta_{PCON}\text{PCON}_0 + \beta_{PCONDum}\text{PCON}_0 \times \text{Dum} + \beta_M \text{M}_0 + \varepsilon\end{aligned} \tag{6.4}$$

where

$\text{RRC}^{eat}_{\text{nav,t}}$ = residual return contribution from net asset value before administrative expenses and taxes in period t

PCON = portfolio concentration

Dum = 1 if the observation is prior to 1981 and 0 otherwise[179]

M = a measure of controlling power based on portfolio concentration times ownership concentration

[179] Note that when the regressions are only run for the 1981 – 2004 the PCON× D variable is excluded.

All four regressions are run for two time periods, 1973 – 2004 and 1981 – 2004 using British and Swedish data. The Swedish data are used in three different ways. First, the full data set is used. Then, two sub-samples are constructed. The first sub-sample contains companies which are controlled by a small number of shareholders and which are assumed to be more prone to agency problems. These companies are called "sphere companies". The second sub-sample contains companies which primarily invest in quoted securities. These companies are called "pure companies".

Subsequently, an attempt to divide administrative expenses into agency costs and other administrative expenses is made. The two parts of administrative expenses are then analyzed in the framework of regressions 6.3 and 6.4.

Finally, the impact on premiums from the level of asset risk is tested. The hypothesis is that the lower level of asset risk the less the agency problems are and the higher the premiums. This is tested by inserting a variable for the proportion of fixed income securities to assets. Due to data restrictions, this test is only performed for the British sample.

9.1.2 The empirical findings

The empirical findings must be evaluated based on the operationalizations and the context from where they are derived. The effects of the operationalizations are discussed below. Here it must be noted that expectations of future residual return contributions are measured in two ways. These are the average of past residual return contributions and realized future residual return contributions.

The institutional contexts in the UK and Sweden are very different. The composition of the asset portfolios and the restrictions on distributions to the owners are the most divergent areas. The combined findings from all of the samples suggest that these differences may affect premiums substantially. One indication of these differences is the difference in explanatory power of the regression models. For the British sample no more than 9 percent of the variation in premiums can be explained. For the Swedish sample up to 48 percent of the variation in premiums can be explained. One plausible reason for this is that the British companies are more of a traditional financial intermediary (financial managers) with strong limitations on the industrial influence. Many of the Swedish companies have an industrial ambition combined with the management of investors' funds. These characteristics of the Swedish companies allows for substantial variation in the actions taken and the outcomes of these actions. Moreover, the evaluation of the strategies and actions by the Swedish companies can then be evaluated in more dimensions and resulting in more varying premiums. However, these industrial ambitions may also call for longer evaluation periods and specific information regarding each portfolio company. No evidence of that has been found here.

Regarding specific explanations for the premiums, the following empirical findings have been identified:

- Premiums are weakly positively related to past performance;
- Premiums are weakly positively related to future expected performance for unquoted securities;
- Premiums are strongly negatively related to administrative expenses classified as agency costs.
- Premiums are less correlated with performance on quoted securities than to performance on unquoted securities;
- Premiums are strongly positively related to other administrative expenses;
- Premiums are not related to taxes;
- Premiums are strongly negatively related to diversification. The impact is particularly strong in the range of low to medium levels of diversification;
- Premiums are strongly negatively related to controlling power. This negative relationship is more emphasized when shares with different voting power is used;
- Low asset risk limits negative premiums:
- The value impact of diversification is dependent on the access to the capital markets by the investors. Capital market restrictions make the relationship between diversification and premiums positive.
- British companies and Swedish pure companies show similar empirical results with respect to relationship between premiums and explanatory variables even though premiums differ substantially. The two groups are more similar in their underlying characteristics such as asset composition, than the other Swedish companies and the British companies
- Indications that the capital markets price unquoted securities as if conservative measurement is considered are identified.

9.2 Findings in the context of purpose and background

The purpose of this study is formulated as:

to theoretically and empirically investigate determinants for the premiums on closed-end investment companies in a European context.

The purpose contains two parts, one theoretical and one empirical part. These investigations should be done in a European perspective. The theoretical investigation is not regional in a direct sense, but the theoretical explanations are gathered with the specific European institutional context in mind. The emphasis of the explanation is on the differences in ownership structure, portfolio composition and market development. With respect to ownership structure and portfolio composition, the companies in Europe are less tightly regulated than their US counterparts. This allows for greater possibilities to investigate these determinants of premiums. Moreover, the market environment, particularly in Sweden, has changed substantially over the studied period. This can be seen as an indication for the position of this kind of companies in similar market positions.

9.2.1 The theoretical perspective

The theoretical investigation is founded on established valuation theory. The notion that the value of an asset is the present value of future cash flows is the core in this framework. More specifically, the study is based on the residual income model. This model distinguishes between the current value to the owners in terms of net asset value and future value creation. Since net asset value is a separate component of value, the structure provides a simple expression for premiums.

The theoretical framework has been adjusted to the situation of multiple portfolios of securities, distinguishing between quoted and unquoted securities. This distinction enables analyses of the different characteristics of the two portfolios with respect to, for example, revenue recognition.

Established asset pricing theory relies on concepts of risk that are either mean-variance based (like CAPM) or based on unidentified risk factors (like arbitrage pricing theory). Previous empirical work has identified risk factors that are compatible with the arbitrage pricing theory (e.g. Fama and French, 1991). Conceptually, risk is not necessarily measured in terms of a continuous spread in outcomes or generally that bad cash flows materialize in the future. Risk can be seen as a widely spread perception held by relevant investors that something can happen to them that deserves a price effect. This may or may not result in systematic return effects. A price shift due to the existence of a characteristic of the company that is perceived as potentially problematic for the price setting investors can be seen as a form of risk. This can for example be a particular ownership structure.

No attempt has been made to explicitly incorporate additional measures of risk in the theoretical model. Such an approach would have been beyond the scope of a fundamentally empirical study. Instead additional theoretical approaches have been amended to, not included in, the original theoretical framework. These approaches focus on investor divergence of opinion (heterogeneous beliefs) and agency costs. They have been seen as complements to a traditional approach.

The collective approach has resulted in the use of several similar and overlapping theoretical concepts. The interaction between the concepts of diversification and formal power has resulted in a focus on controlling power. The theoretical arguments in the agency literature rest on assumptions of the egoistic value maximization of each individual. This generates cases where the existence of formal power is synonymous with controlling power. This study has argued that from a value perspective formal control is sufficient to result in value effects. However, the value effects should be even stronger when indications of controlling power are identified, i.e. when the formal power is eventually being used for the purposes of the shareholders holding the formal power.

9.2.2 The empirical perspective

From an empirical perspective, the contributions are concerned with the three areas mentioned above: performance, diversification and ownership structure (controlling power).

The previously presented empirical evidence on the relationship between performance and premiums is vast. Despite this, little support for a strong and consistent relationship has been found. This study provides additional insight into how the market assesses the performance of European companies. In line with the American studies little support is found for a relationship between performance and premiums. It shows, however, that a distinction between quoted and unquoted securities is relevant in understanding the premium levels on closed-end investment companies. This finding indicates that the market prices the companies consistently with the conservative measurement practices used by some companies. No previous tests have been made based on a distinction between the performance on quoted and unquoted securities.

The impact of administrative expenses on premiums is theoretically indisputable but empirically unverified[180]. Previous studies have used various measures of administrative expenses, although most attempts found only weak relationships. In addition to the traditional approach of linking expense levels to premiums, this study examines the cause of the administrative expenses. Effectively two causes of administrative expenses are examined: agency/diversification and other explanations. In particular explicit links between the two causes and administrative expenses are examined using regressions.

The identification of the two parts of administrative expenses and the strong empirical results for the Swedish (sub-)samples contributes to the understanding of the role of administrative expenses. The findings suggest that monetary agency costs are incurred and that the market prices these expenses in line with theory. The lack of significant findings from the British data suggests that agency based expenses are much harder to identify when weaker measures of formal power (percentage of votes or capital) are used. The possibility to gain control over a company with a minimum level of capital drives agency based expenses. Indications of differential voting rights as a stronger measure of agency based expenses are found in the Swedish sample compared to the measures of votes and capital respectively.

Previous research does not include any such detailed studies of the cause of administrative expenses and their impact on premiums.

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[180] Under the assumption of complete replicability and absence of transaction costs, the no arbitrage condition would drive a negative relationship.

No study has been identified where diversification as an explanatory variable for premiums has been investigated. This study provides a direct contribution addressing this issue. Diversification is originally the core service provided by these companies. From this perspective, an investigation into the value effects of diversification is partly a question of the existence of the companies. The study suggests that more highly concentrated portfolios increase premiums. This finding can be seen as a challenge to the fundamental idea of closed-end investment companies. It is, however, compatible with arguments based on heterogeneous beliefs. Individual investors with specific preferences and opinions about securities do not necessarily agree with others about values. Consequently, it can not be beneficial to delegate the control over the portfolio content.

If diversification has a negative economic impact on value, other incentives for the existence of closed-end investment companies must exist. For example in the past these companies have served the purpose of providing easy access to the capital markets. This was particularly so when the stock market was more regulated in Sweden during the 1970s. During these years, the market seems to have priced diversification more beneficially than it does subsequent to 1981.

Closed-end investment companies in the UK and in the US are used for private pension savings. A continuous demand for the shares of these companies guarantees their survival. An investment in an already existing company is not value destroying given that the negative premiums prevail at the same level at the time of divestment. Higher returns would have been obtained from liquidation, but the individually non-influential investors are not strong enough to force liquidation.

The Swedish companies existing today have a very concentrated ownership structure. A few individuals with close business or family relationships control the companies. In most cases they own shares with higher voting rights compared to the shares for the remaining shareholders. The controlling shareholders can benefit from their situation in many ways and they have no incentive to liquidate the company. The situation becomes difficult to change.

These latter explanations for the existence of closed-end investment companies focus on ownership concentration and corporate control. The findings from this study strongly suggest that ownership concentration is important in understanding the premiums. Influence and control are identified as having negative impacts on the value of the company for the non-influential shareholders. Controlling power appears to be particularly detrimental to the value of the shares for the non-influential shareholders. Note that this does not necessarily means that the value of the company is lower due to the controlling power. It is possible that there is only a redistribution of value between controlling and non-influential shareholders.

The European perspective has not only enriched this study by identifying diversification and control/power as potential factors explaining premiums. In addition, the different tax systems in the UK and Sweden cause different behaviors from the companies, which further makes it possible to study the impact of all of the three concepts, performance, diversification and power/control.

9.3 Research design, theoretical explanations and findings

The research design employed in this study is based on statistical tests. Statistical analyses are designed to find regularities in samples. Given certain assumptions we can infer with some precision that the regularities prevail in the underlying population from which the sample is drawn. In order to make reliable inferences about the underlying population, the sample has to be random and sufficiently large. A large sample is readily obtained when wide capital market studies are performed. The random sample should prevent biased results relative to the population. In this case the sample is very close to the population. The relationship between the aggregated capital market, the theories used and possible conclusion is fundamental. This is particularly so, since little is known about the aggregation of individual investors' beliefs and actions. Additionally, little is known about the manifestation of these beliefs and actions in observable prices.

Under the assumptions of homogeneous beliefs and rationality, the actions taken by each investor is identical given the investors' risk preferences and prices are set as a function of these beliefs. Adjustments to the neoclassical model are not necessary. Moreover, we can study the market as a whole or any individual and the result will be the same[181]. This study goes beyond the assumption of homogeneous beliefs. First, heterogeneous beliefs are explicitly assumed. Second, conflicts of interest between dominant and non-influential shareholders are assumed.

The concepts of heterogeneous beliefs and conflicts of interest can be studied in numerous ways. The capital market based statistical approach investigates the effects of these concepts on market premiums. The effects are studied given the operationalizations made of the concepts. Potentially, the link between what is effectively being studied and the aims of the study might be weak. Even if the operationalizations are good, questions remain.

This study has shown that there are strong indications of heterogeneous beliefs and conflicts of interest between investors which has an impact on the pricing of closed-end investment companies. Such indications are found in both the British and Swedish samples. The findings are strengthened when sub-samples of the Swedish companies are constructed to focus more on these issues. The findings are strong not only in a statistical sense. The economic effects are estimated to be substantial (see section 8.1).

From an investment perspective, these findings are important. As investors, we need to act on two sets of information. First there is the company specific information. This is the basis for our fundamental perceptions of a company. This information is processed to obtain our individual value of the company. Second, there is the understanding of the pricing process and observed market prices. This study has provided us with more information about this process.

The theoretical predictions are based on individual investors with heterogeneous beliefs about the value of different investments. Is this a good description of reality? Do heterogeneous beliefs necessarily drive a negative premium on delegated diversification? A core reference in the area, Miller (1977) claims that it is not reasonable to assume that an investor is positive to all investments in a diversified portfolio. This is fairly weak statement of the prediction. Further knowledge about how individual investors perceive delegated diversification is required.

[181] The only reason for choosing to study the individuals would be to understand how the process of obtaining the beliefs and generating actions is structured.

Moreover, generally it is assumed that there exist at least two groups of investors. These are one internally dominant but marketwise passive group and one internally non-influential but marketwise active group. In this study, it is documented that there exist internally dominant groups in terms of formal power. A deeper understanding about who is the marginal investor and who is trading when on the market for closed-end investment company shares would shed more light on the findings above.

The underlying valuation model, the residual income model, does not require homogeneous beliefs and a single investor group. The value obtained from the model given the predictions of future profitability is subjective. Therefore, it is not until the model is used explicitly as a description of how prices are set on the market that additional assumptions are required. In this context we do not know about the impact on the predictions of future profitability from the existence of heterogeneous beliefs and conflicts of interest. Neither do we know much about the mapping from the expectations to premiums. This is particularly so when realized profitability is used to proxy for the expectations.

9.4 Operationalization of concepts –validity

The focus in the study has been on three areas of explanations. These are performance, diversification and control/power. Each of these concepts is operationalized in different ways. The operationalization may cause a divergence between the meaning of the concept and what is actually being measured. A substantial divergence would make the study irrelevant. It is then important to understand the effects of the choices on the final outcomes.

Performance is measured by using realized residual returns for both historic and as a proxy for market expected future residual returns. Historic performance is measured as an average of the past three years' residual returns. This is done in order to capture a reputation effect which allows for extrapolations of residual returns rather than pure mechanical extrapolation[182]. The empirical data showed no time series correlation. The

[182] A positive relationship between historic performance and premiums is interpreted as an indication of managerial ability. An alternative would be to interpret it as an extension of a trend by the market participants without a reference to managerial ability.

absence of serial correlation further substantiates the aim of trying to capture more or less rational reputation effects. Is three years sufficient to capture reputation? The often discussed short term focus of the capital market suggests that a short period if sufficient to capture reputation. Additionally, changes in the management team and similar disruptions probably influence the power of reputation. The exact choice of three years can not be readily motivated from other than statistical bases.

Using realized future residual return contributions as a proxy for the expectation of future residual return contribution is somewhat heroic. Previous research has hardly documented any persistence in performance. A different approach is therefore reasonable to test. Another interesting alternative would have been to use analysts' forecasts. However, no such data are available. More sophisticated prediction models based on time series properties of historical data can be developed. This can be seen as a suggestion for future improvements.

Performance is measured as the increase in market values of the portfolio holdings relates to a market benchmark. This performance is claimed to affect premiums. It is important to emphasize that this measure of performance is not necessarily the same as value increasing activities.

Diversification is used in two ways in this study: in itself (pure diversification) and in combination with formal power. The main consideration is to construct a measure that is suitable for the pure diversification variable. The variable must reflect how many securities are included in the portfolio and the proportions of the total value of the portfolio. An additional issue concerns, which securities to be encompassed by the diversification measure. This study focuses on quoted securities only and on the impact of a small number of companies, i.e. three.

This focus excludes subsidiaries and companies that may be held for industry strategic purposes. Unquoted securities are also exposed to subjective valuation in the net asset value calculations. These effects may distort a true diversification measure.

Substantial diversification effects are obtained even with a rather narrow set of securities in the portfolio as long as the securities are sufficiently uncorrelated. Consequently, in order to capture effects of portfolio diversification/concentration, the number of shares included in the measure has to be small. The exact number of securities included in the measure is an empirical issue. Different numbers of securities have been tested empirically and using the three largest quoted securities were shown to give the best empirical results. The results using other measures have not been included here.

Of course diversification is also obtained through unquoted securities. The measure employed may then in certain cases affect the representation of diversification/concentration. Whether an understatement or overstatement of diversification/concentration is present is not readily distinguishable. The effect on the measure is most likely stronger for the Swedish (sub-)samples than for the British sample. This is because the proportion of unquoted securities is much higher in the Swedish sample which drives stronger effects. An exact analysis of the effects is very difficult to make since detailed data on the market value of unquoted securities is not available.

Diversification/concentration is a component of controlling power. Controlling power is composed of formal power and portfolio concentration. A highly concentrated portfolio is seen as an indicator that the closed-end investment company is used to gain control over other companies. In this context, a diversification measure also encompassing unquoted securities may have been more appropriate. This is because controlling power is aimed at representing the situation where a small group of owners control the investment company and where the investment company in turn controls other companies.

It can be argued that the measure of portfolio diversification is not a good measure of control over the portfolio companies. A small investment company can not exercise control over other companies even if the portfolio of securities is highly concentrated. This is a very legitimate concern. The issue relates to the strategy of the investment companies. A small closed-end investment company with a strategy based on picking a small number of investments combined with a high votes-to-capital ratio shows high controlling power. If the investments are in very large companies, they may not be able to exercise any control at all. Another case is when most of the portfolio is made up of unquoted securities and a small number of quoted securities are held. The same problem occurs here. Admittedly, the measure is crude in this sense. An examination of the observations in the sample suggests that the number of companies showing the above mentioned characteristics appears to be small.

Formal power is a concept that is used in many different ways in the analysis. Three alternative measures are used: percentage of capital rights, the percentage of voting rights and the votes-to-capital ratio. These measures have also been used in previous research. Each measure is designed to capture the largest shareholder's or related group of shareholders' position in the company. The study has relied on the classification by Sundqvist et al. (1985 – 2004) for the Swedish companies. In the British case an examination of the names of the owners and the relationships between different organizations, such as investment trusts, have been made. No substantial modifications to the raw data are made.

A more sophisticated measure of controlling power would be preferable. An alternative would be to examine the votes-to-capital ratio in the relationship between the investment company and the portfolio companies. Additionally, a control for the size of the investment company in this relationship could be used. Despite a much cruder measure, the results are strong and highly significant.

9.5 Concluding remarks

This study has been aimed at providing explanations for the closed-end investment company premiums. Stated differently, variables trying to capture the actions taken and the economic effects of these actions have been used to trying to understand the observed premiums. Many choices have been made concerning operationalizations, which may have affected the results. However, most of observations have been shown to be robust when certain sensitivity tests have been performed.

The differences in the institutional setting and company characteristics between the Swedish and British companies have been used in trying to understand the premiums. The strongest coefficient estimates in the study has been obtained for the portfolio concentration and controlling power variables. This is also the area where companies from the two countries differ most together with the proportion of unquoted securities. The British tax laws require a high degree of portfolio diversification for the British investment trusts. This means that the British companies can not obtain high levels of controlling power. Similar restrictions are not present for the formal power over the investment trust (ownership structure). The evidence from the British companies suggests that the existence of a comparatively large owner generate somewhat more negative premiums. Effectively formal power is sufficient.

The Swedish companies also show that formal power is sufficient to obtain a negative impact on premiums. However, the Swedish companies are much more heterogeneous regarding the portfolio concentration and with generally higher levels. This has proven informative when it comes to premium effects. The marginal impact from formal power (votes-to-capital ratio) is substantial when a focused portfolio strategy is employed. Apparently, the more liberal Swedish tax laws allow for actions taken by the closed-end investment companies that create diversity also with respect to premium levels. It has also been indicated that existence of dual-class shares with respect to voting power has a negative influence on premiums. The higher premiums for the British companies relative to the Swedish companies can potentially partly be explained by the one-share-one-vote concept.

The Swedish and British companies show very similar results with respect to the residual return contributions. Residual returns on quoted securities have only a marginal impact on premiums in both countries. This consistency in an area where no apparent difference exists is reassuring. The very small coefficients on future residual return contributions for the British and the pure Swedish sub-sample indicates similarities. Both these sample have high levels of quoted securities, whose residual returns are hard to forecast. The only indications of a slightly larger impact on premiums from future residual returns are obtained from the Swedish all companies sample and sphere companies sub-sample. These are the (sub-)samples with the highest degree of unquoted securities. The unquoted securities can be included in net asset value at conservative values or being traded on less efficient markets. This could improve the possibility to forecast future residual returns.

Both taxes and administrative expenses show similar effects on premiums for the Swedish and British companies. Both tax systems are effective in eliminating tax payments for the companies and the companies adhere to the requirements. Concerning administrative expenses, estimated coefficients are sometimes insignificant and consistently positive for both countries. Both of these observations are against the predictions. The valuation of administrative expenses appears to be the same in the two countries. However, the explanations for this unexpected outcome ought to be searched for globally.

Some of the Swedish companies see themselves as industrialists with a long term active ownership in the portfolio companies. This means that the management of the closed-end investment companies intends to affect the actions and strategies of the portfolio companies. The measurement of this process in terms of wealth creation is difficult. Reasonably, effects of this work in the portfolio companies are not materialized in a single year. The residual return measures included in this study are relatively short termed. This generates a considerable mis-match. This problem is accentuated when large investments are not continuously made and with similar outcomes to equal out over time. A deeper understanding of these process and the effects on pricing is required to understand the premiums.

The observation above concerning the residual return contribution from unquoted securities and long term active investments can be considered from an information perspective. The current study has entirely focused on the quantitative market based data on these companies, the return figures and aggregated portfolio composition. A question to ask is what do investors know about these companies? For example, information about the unquoted securities included in the portfolio may be hard to obtain from other sources. What information does the closed-end investment company provide to the market? What is the quality of this information? Can it be that the negative premiums are a reaction to information of bad or low quality and what we see is an information asymmetry premium? This could be due to both information about the investment strategies of the investment company and the prospects of the current investments. The investors are provided with general information about the overall investment strategies. This gives little guidance about the practical future portfolio composition. If the closed-end investment companies provided information about their investment prospects for the future, this could be considered improved information with premium effects but it is hardly likely to be provided. None of these issues have been approached, but they can be of importance for premiums.

Finally, this study has not explored the return effects on investment strategies based on premiums. Are closed-end investment companies good investments due to the negative premiums? The studied issues of heterogeneous beliefs and controlling power seem to affect prices. However, is it so that they affect future cash flows and thereby systematically causing premiums or are they risk adjustments that increase expected returns? This study has been limited to examine the relationship between various explanatory variables and premiums based on theoretical predictions at individual points in time. The time series properties of premiums and returns on closed-end investment companies with respect to cash flows and risk remain to be studied in more detail and between countries.

The existence and characteristics of closed-end investment companies have been examined once again, but the phenomenon persists and requires additional attention. On the first three pages five questions were asked:

- Is it possible to buy something for less that it is worth?
- Does the relationship between the owners as a group and the company make a comparison between the current market value of assets and liabilities and the market value of the financial intermediary inappropriate?
- Does the pooling of funds from different individuals with different perspectives on investment opportunities matter with respect to portfolio choices?
- Does the ownership structure of the financial intermediary matter?
- Are there institutional or structural differences that explain the international differences in levels and time-series variations of premiums?

No distinct answers have been delivered. However, the comparatively high explanatory power of the regression models indicates the maybe the existence of premiums can be explained by rational arguments. The findings suggest that the existence of separate owner groups and a structural stability between the groups drives negative premiums. The existence of owner groups and the individuals' perceptions value appears to be value relevant. Moreover, the characteristics of the institutional settings for the market and the companies matters. Despite the lack of distinct answers, some indications of answers to the questions have been provided. Still, the research and creations of more refined measures will continue.

List of Abbreviations

Abbreviation		Explanation	First appearance on page
AE	=	Aggregation error	76
β	=	Regression coefficient on an independent variable for a measure	82
bv	=	Book value of owners' equity (net assets)	70
CAPM	=	Capital Asset Pricing Model	25
$CF_{RRCcomponent}$	=	Convergence factor for a specified RRC component	90
ND	=	Market value of net debt (net financial liabilities)	86
$\frac{ND}{E}$	=	Net debt-to-equity ratio of the company at market value	75
Dum	=	Dummy variable which is 1 if the observation is prior to 1981 and 0 otherwise	137
$E_0[\cdot]$	=	Expectations operator indicating that expectations are formed at the valuation date	70
EAE	=	Extended aggregation error	78
$f(\bullet)$	=	Indicates some functional form of the expression within parentheses	111
G_t	=	Cumulative growth rate in net asset value from time 0 to time t	72
H	=	Valuation horizon date/period	71
$\lambda.$	=	Combined convergence measure for the residual return contribution and growth for a residual return contribution	88
M_0	=	Measure of controlling power due to agency situation in the closed-end investment company at the valuation date	82
M_1	=	Measure of controlling power using the votes-to-capital ratio as the measure of formal power	118
M_2	=	Measure of controlling power using the fund manager controlled percentage of votes as the measure of formal power	118

M_3	=	Measure of controlling power using the beneficial owner controlled percentage of votes as the measure of formal power	118
MV()	=	Market value of a balance sheet item	84
N	=	Number of shares included in the investment company portfolio and it defines the specific content of that portfolio	212
nav	=	Net asset value	5
nfl	=	Net financial liabilities	73
noa	=	Net operating assets	73
nqs	=	Net quoted securities	73
nqs^{acq}	=	Net quoted securities at acquisition cost	106
nus	=	Net unquoted securities	73
$OCON_1$	=	Votes-to-capital ratio for the largest shareholder	216
$OCON_2$	=	Percentage of capital controlled by the largest shareholder	216
$OCON_3$	=	Percentage of votes controlled by the largest shareholder	216
PCON	=	Portfolio concentration as a measure of heterogeneous beliefs	82
$Premium_{T+1 \rightarrow H,T}$	=	Intrinsic premium related to information for period T+1 to period H valued at time T	90
r_{ND}	=	Required rate of return on net debt	75
r_E	=	Required rate of return on equity	70
$r_{f,}$	=	Risk free rate of return	107
r_m	=	Market rate of return	107
r_{NQS}	=	Required rate of return on net quoted securities	77
r_{NUS}	=	Required rate of return on net unquoted securities	77
r_u	=	Required rate of return on the unlevered company	75
RNAV	=	Return on net asset value	72
$RNAV^{eat}$	=	Return on net asset value excluding administrative expenses and taxes	105
RNFL	=	Return on net financial liabilities	74

RNOA	=	Return on net operating	74
RNQS	=	Return on quoted	77
RNUS	=	Return on unquoted securities	77
RR_{nfl}	=	residual return on net financial liabilities	76
RR_{noa}	=	Residual return on net operating assets	76
RR_{nqs}	=	Residual return on net quoted securities	78
RR_{nus}	=	Residual return on net unquoted securities	78
RRC_{adm}	=	Residual return contribution from administrative expenses	74
RRC_{nav}	=	Residual return contribution from net assets	76
RRC_{nav}^{eat}	=	Return on net asset value excluding administrative expenses and taxes	100
RRC_{nfl}	=	Residual return contribution from net financial liabilities	78
RRC_{nqs}	=	Residual return contribution from net quoted securities	78
RRC_{nus}	=	Residual return contribution from net unquoted securities	78
RRC_{tax}	=	Residual return contribution from taxes	74
V	=	Instrinsic value of net assets	70
$V_{nav,i}$	=	Subjective net asset value to investor i	212
$V_{n,i}$	=	Subjective value of share n to investor i	212
V/C	=	Votes-to-capital ratio for the largest shareholder	116
$\tilde{x}^a$	=	Abnormal earnings	70
$\tilde{x}$	=	Comprehensive earnings	70

Appendix 3.1 Derivation of the theoretical model

The value of an asset is given by the present value of the cash flows from the asset, in the case of a share, the dividends.

$$V_0 = \sum_{t=1}^{\infty} \left(\prod_{s=1}^{t} (1 + r_{E,s}) \right)^{-1} \times E_0 \left(\widetilde{\text{Dividends}}_t \right) \qquad \text{(A3.1)}$$

The valuation date has been normalized to period 0.
V_0 = intrinsic value of the share at the valuation date
r_E = required rate of return on equity
E() = expectations operator

Before the model can be derived four assumptions are required. These are

A:1	The value of an asset is the present value of its net cash flows. In the case of a share in a company, the cash flows are the net dividends[1].
A:2	The clean surplus relation holds.
A:3	Dividends and capital contributions from owners are marked to market.
A:4	There risk of bankruptcy is negligible.

The clean surplus relation is expressed as:

$$\text{Dividends}_t = x_t + \text{nav}_{t-1} - \text{nav}_t \qquad \text{(A3.2)}$$

x_t = comprehensive earnings in period t
nav = net asset value = market or estimated market value of the assets less the value of the liabilities of the company

The clean surplus relation of accounting can be restated using

$$x_t^a = x_t - r_{E,t} \times \text{nav}_{t-1} \qquad \text{(A3.3)}$$

x_t^a = Residual earnings in period t

which gives

$$\begin{aligned} \text{Dividends}_t &= x_t^a + r_{E,t} \times \text{nav}_{t-1} + \text{nav}_{t-1} - \text{nav}_t = \\ &= x_t^a + (1 + r_{E,t}) \times \text{nav}_{t-1} - \text{nav}_t \end{aligned} \qquad \text{(A3.4)}$$

[1] Net dividends are defined as dividends less capital contributions from owners.

Inserting the expression for dividends in the initial valuation expression (A3.1), the residual income model is obtained. Here the expectations operator is being dropped.

$$
\begin{aligned}
V_0 &= \sum_{t=1}^{\infty}\left(\prod_{s=1}^{t}(1+r_{E,s})\right)^{-1} \times (\tilde{x}_t^a + (1+r_{E,t}) \times \tilde{\text{nav}}_{t-1} - \tilde{\text{nav}}_t) = \\
&= (1+r_{E,1})^{-1} \times (\tilde{x}_1^a + (1+r_{E,1}) \times \text{nav}_0 - \tilde{\text{nav}}_1) + \\
&+ \left(\prod_{s=1}^{2}(1+r_{E,s})\right)^{-1} \times (\tilde{x}_2^a + (1+r_{E,2}) \times \tilde{\text{nav}}_1 - \tilde{\text{nav}}_2) + \\
&+ \left(\prod_{s=1}^{3}(1+r_{E,s})\right)^{-1} \times (\tilde{x}_3^a + (1+r_{E,3}) \times \tilde{\text{nav}}_2 - \tilde{\text{nav}}_3) + \\
&+ \left(\prod_{s=1}^{4}(1+r_{E,s})\right)^{-1} \times (\tilde{x}_4^a + (1+r_{E,3}) \times \tilde{\text{nav}}_3 - \tilde{\text{nav}}_4) + \\
&+ \left(\prod_{s=1}^{5}(1+r_{E,s})\right)^{-1} \times (\tilde{x}_5^a + (1+r_{E,4}) \times \tilde{\text{nav}}_4 - \tilde{\text{nav}}_5) + \ldots\ldots = \\
&= \text{nav}_0 + \sum_{t=1}^{T}\left(\prod_{s=1}^{t}(1+r_{E,s})\right)^{-1} \times \tilde{x}_t^a - \left(\prod_{s=1}^{T}(1+r_{E,s})\right)^{-1} \times \text{nav}_T
\end{aligned}
\tag{A3.5}
$$

Assuming that

$$
\left(\prod_{s=1}^{T}(1+r_{E,s})\right)^{-1} \times \text{nav}_T \rightarrow 0 \text{ as } T \rightarrow \infty \tag{A3.6}
$$

i.e. that the present value of the net asset value of the company goes to zero as time approaches infinity or that the expected yearly growth rate net asset value is lower than the required rate of return. Moreover, there are no expected residual earnings after period T. By letting T goes towards infinity, and applying the assumption in A3.6, the last term of (A3.5) can be removed and there is an expression for the intrinsic value of net assets as in (A3.7)

$$V_0 = nav_0 + \sum_{t=1}^{\infty}\left(\prod_{s=1}^{t}(1+r_{E,s})\right)^{-1} \times \tilde{x}_t^a \tag{A3.7}$$

By further assuming that all residual earnings are less than infinitely large a quantifiable measure of the intrinsic value can be obtained.

$$x_t^a < \infty \text{ for all t} \tag{A3.8}$$

The residual earnings can be rewritten in terms of returns and beginning of period net asset value as in (A3.8).

$$x_t^a = \left(\mathrm{RNAV_t} - r_{E,t}\right) \times \mathrm{nav}_{t-1} \tag{A3.8}$$

where

$\mathrm{RNAV_t} = \dfrac{x_t}{\mathrm{nav}_{t-1}}$ = Return on net asset value in period t

Inserting (A3.8) into (A3.7) gives

$$V_0 = nav_0 + \sum_{t=1}^{\infty}\left(\prod_{s=1}^{t}(1+r_{E,s})\right)^{-1} \times \left(\mathrm{R\tilde{N}AV_t} - r_{E,t}\right) \times \mathrm{n\tilde{a}v}_{t-1} \tag{A3.9}$$

By recognizing that the difference between the intrinsic value and the net asset value at any point in time is the present value of future residual earnings subsequent to that point in time, a valuation horizon can be inserted.

$$V_H - nav_H = \sum_{t=H}^{\infty}\left(\prod_{s=H}^{t}(1+r_{E,s})\right)^{-1} \times \left(\mathrm{R\tilde{N}AV_t} - r_{E,t}\right) \times \mathrm{n\tilde{a}v}_{t-1} \tag{A3.10}$$

then

$$\begin{aligned} V_0 = nav_0 &+ \sum_{t=1}^{\infty}\left(\prod_{s=1}^{t}(1+r_{E,s})\right)^{-1} \times \left(\mathrm{R\tilde{N}AV_t} - r_{E,t}\right) \times \mathrm{n\tilde{a}v}_{t-1} + \\ &+ \left(\prod_{s=1}^{T}(1+r_{E,s})\right)^{-1} \times \left(V_T - \mathrm{n\tilde{a}v}_H\right) \end{aligned} \tag{A3.11}$$

Now it is possible to turn (A3.11) into an expression for the closed-end investment company premium. The premium is defined as

$$\text{Premium}_t = \frac{V_t}{\text{nav}_t} - 1 \tag{A3.12}$$

Consequently, an expression for the premium can be obtained by dividing both sides of (A3.11) with nav_0 and subtracting both sides with 1.

$$\begin{aligned}
V_0 &= \text{nav}_0 + \sum_{t=1}^{\infty}\left(\prod_{s=1}^{t}(1+r_{E,s})\right)^{-1} \times \left(\text{RN}\tilde{\text{A}}\text{V}_t - r_{E,t}\right) \times \text{n}\tilde{\text{a}}\text{v}_{t-1} \\
&+ \left(\prod_{s=1}^{H}(1+r_{E,s})\right)^{-1} \times \left(V_H - \text{n}\tilde{\text{a}}\text{v}_H\right) \Rightarrow \\
\frac{V_0}{\text{nav}_0} &= 1 + \sum_{t=1}^{\infty}\left(\prod_{s=1}^{t}(1+r_{E,s})\right)^{-1} \times \left(\text{RN}\tilde{\text{A}}\text{V}_t - r_{E,t}\right) \times \tilde{G}_{t-1} + \\
&+ \left(\prod_{s=1}^{H}(1+r_{E,s})\right)^{-1} \times \text{Pre}\tilde{\text{m}}\text{ium}_H \times \tilde{G}_H \Rightarrow \\
\text{Premium}_0 &= \sum_{t=1}^{\infty}\left(\prod_{s=1}^{t}(1+r_{E,s})\right)^{-1} \times \left(\text{RN}\tilde{\text{A}}\text{V}_t - r_{E,t}\right) \times \tilde{G}_{t-1} + \\
&+ \left(\prod_{s=1}^{H}(1+r_{E,s})\right)^{-1} \times \text{Pre}\tilde{\text{m}}\text{ium}_H \times \tilde{G}_H
\end{aligned} \tag{A3.13}$$

where

$G_t = \dfrac{\text{nav}_t}{\text{nav}_0}$ = Cumulative growth in net asset value from the valuation date to date t

The next step is to decompose the expression for residual returns. By using the structure of the balance sheet and income statement in figure 3.1, page 72, an expression for the return on net asset value obtained as

$$\text{RNAV}_t = \left[\text{RNOA}_t + \left(\text{RNOA}_t - \text{RNFL}_t\right)\frac{\text{nfl}_{t-1}}{\text{nav}_{t-1}}\right] - \text{RRC}_{\text{tax},t} - \text{RRC}_{\text{adm},t} \tag{A3.14}$$

where

$$\text{RNOA}_t \equiv \frac{\text{Operating earnings before administrative expenses}_t}{\text{Net operating assets}_{t-1}} = \tag{A3.15}$$

$= \text{Return on net operating assets in period t}$

$$\text{RNFL}_t \equiv \frac{\text{Financial expenses}_t \text{ - Financial revenues}_t}{\text{Net financial liabilities}_{t-1}} = \tag{A3.16}$$

$= \text{Return on net financial liabilities}$

$$\text{RRC}_{\text{adm},t} \equiv \frac{\text{Administrative expenses}_t}{\text{net asset value}_{t-1}} = \tag{A3.17}$$

$= \text{Residual return contribution from administrative expenses in period t}$[2]

$$\text{RRC}_{\text{tax},t} \equiv \frac{\text{Taxes}_t}{\text{Net asset value}_{t-1}} = \tag{A3.18}$$

$= \text{Residual return contribution from taxes in period t}$

Additionally, the required rate of return on net asset value can be decomposed in the spirit of Miller and Modigliani proposition I as

$$r_{E,t} = r_{u,t} + \left(r_{u,t} - r_{ND,t}\right)\frac{\text{ND}_{t-1}}{\text{E}_{t-1}} \tag{A3.19}$$

where

$r_{u,t}$ = required rate of return on the unlevered company in period t

$r_{ND,t}$ = required rate of return on net debt in period t

$\frac{\text{ND}_t}{\text{E}_t}$ = the net debt - to - equity ratio of the company at market value in period t

By subtracting A3.19 from A3.14, an expression for the residual return contribution on net asset value is obtained.

[2] The notation RRC standing for residual return contribution is an adjustment to the final structure of the model presented later.

$$\mathrm{RNAV_t} - r_{E,t} = \begin{bmatrix} \mathrm{RNOA_t} + (\mathrm{RNOA_t} - \mathrm{RNFL_t})\dfrac{\mathrm{nfl_{t-1}}}{\mathrm{nav_{t-1}}} - \\ - r_{u,t} + (r_{u,t} - r_{ND,t})\dfrac{\mathrm{ND_{t-1}}}{\mathrm{E_{t-1}}} \end{bmatrix} - \mathrm{RRC_{tax,t}} - \mathrm{RRC_{adm,t}} =$$

$$= \begin{bmatrix} \mathrm{RNOA_t} + (\mathrm{RNOA_t} - \mathrm{RNFL_t})\dfrac{\mathrm{nfl_{t-1}}}{\mathrm{nav_{t-1}}} - \\ - r_{u,t} - (r_{u,t} - r_{ND,t})\left(\dfrac{\mathrm{ND_{t-1}}}{\mathrm{E_{t-1}}} + \dfrac{\mathrm{nfl_{t-1}}}{\mathrm{nav_{t-1}}} - \dfrac{\mathrm{nfl_{t-1}}}{\mathrm{nav_{t-1}}}\right) \end{bmatrix} - \mathrm{RRC_{tax,t}} - \mathrm{RRC_{adm,t}} =$$

$$= (\mathrm{RNOA_t} - r_{u,t})\left(1 + \frac{\mathrm{nfl_{t-1}}}{\mathrm{nav_{t-1}}}\right) - (\mathrm{RNFL_t} - r_{ND,t})\frac{\mathrm{nfl_{t-1}}}{\mathrm{nav_{t-1}}} - \qquad \text{(A3.20)}$$

$$- (r_{u,t} - r_{ND,t})\left(\frac{\mathrm{ND_{t-1}}}{\mathrm{E_{t-1}}} - \frac{\mathrm{nfl_{t-1}}}{\mathrm{nav_{t-1}}}\right) - \mathrm{RRC_{tax,t}} - \mathrm{RRC_{adm,t}} =$$

$$= \mathrm{RR_{noa,t}} \times \left(1 + \frac{\mathrm{nfl_{t-1}}}{\mathrm{nav_{t-1}}}\right) - \mathrm{RR_{nfl,t}} \times \frac{\mathrm{nfl_{t-1}}}{\mathrm{nav_{t-1}}} - \mathrm{RRC_{tax,t}} - \mathrm{RRC_{adm,t}} - \mathrm{AE_t}$$

where

$\mathrm{RR_{noa,t}} = (\mathrm{RNOA_t} - r_{u,t})$ = residual return on net operating assets in period t (A3.21)

$\mathrm{RR_{nfl,t}} = (\mathrm{RNFL_t} - r_{ND,t})$ = residual return on net financial liabilities in period t (A3.22)

$\mathrm{AE}_t = (r_{u,t} - r_{ND,t}) \times \left(\dfrac{\mathrm{ND_{t-1}}}{\mathrm{E_{t-1}}} - \dfrac{\mathrm{nfl_{t-1}}}{\mathrm{nav_{t-1}}}\right)$ = aggregation error in period t

In order to get a deeper understanding of the residual return generation, the residual return on net operating assets can be further decomposed into the residual returns from the portfolio of quoted and unquoted securities respectively. Acknowledge that the return on net operating asset is a weighted average of the return from the two sub-portfolios as in (A3.23).

$$\mathrm{RNOA_t} = \mathrm{RNQS_t} \times \frac{\mathrm{nqs_{t-1}}}{\mathrm{nav_{t-1}}} + \mathrm{RNUS_t} \times \frac{\mathrm{nus_{t-1}}}{\mathrm{nav_{t-1}}} \qquad \text{(A3.23)}$$

where

$$\mathrm{RNQS_t} = \frac{\text{Operating earnings on quoted securities excl administrative expenses}_t}{\mathrm{nqs}_{t-1}}$$

$= $ Return on quoted securities in period t (A3.24)

$$\mathrm{RNUS_t} = \frac{\text{Operating earnings on unquoted securities excl administrative expenses}_t}{\mathrm{nus}_{t-1}}$$

$$= \text{Return on unquoted securities in period t} \tag{A3.25}$$

The required rate of return on the unlevered assets can be decomposed accordingly based on the market values of the two portfolios as in (A3.26).

$$r_{u,t} = r_{nqs,t} \times \frac{\mathrm{MV(nqs)}_{t-1}}{\mathrm{MV(nop)}_{t-1}} + r_{nus,t} \times \frac{\mathrm{MV(nus)}_{t-1}}{\mathrm{MV(nop)}_{t-1}} \tag{A3.26}$$

By combining (A3.23) and (A3.26), an expression for the residual returns on each sub-portfolio of securities is obtained.

$$\begin{aligned}
&\mathrm{RNOA}_t - r_{u,t} = \mathrm{RNQS}_t \times \frac{\mathrm{nqs}_{t-1}}{\mathrm{nav}_{t-1}} + \mathrm{RNUS}_t \times \frac{\mathrm{nus}_{t-1}}{\mathrm{nav}_{t-1}} - \\
&- r_{nqs,t} \times \frac{\mathrm{MV(nqs)}_{t-1}}{\mathrm{MV(nop)}_{t-1}} - r_{nus,t} \times \frac{\mathrm{MV(nus)}_{t-1}}{\mathrm{MV(nop)}_{t-1}} = \\
&= \mathrm{RNQS}_t \times \frac{\mathrm{nqs}_{t-1}}{\mathrm{nav}_{t-1}} + \mathrm{RNUS}_t \times \frac{\mathrm{nus}_{t-1}}{\mathrm{nav}_{t-1}} r_{u,t} - \\
&- r_{nqs,t} \times \left(\frac{\mathrm{MV(nqs)}_{t-1}}{\mathrm{MV(nop)}_{t-1}} + \frac{\mathrm{nqs}_{t-1}}{\mathrm{nop}_{t-1}} - \frac{\mathrm{nqs}_{t-1}}{\mathrm{nop}_{t-1}} \right) - \\
&- r_{nus,t} \times \left(\frac{\mathrm{MV(nus)}_{t-1}}{\mathrm{MV(nop)}_{t-1}} + \frac{\mathrm{nqs}_{t-1}}{\mathrm{nop}_{t-1}} - \frac{\mathrm{nqs}_{t-1}}{\mathrm{nop}_{t-1}} \right) = \\
&= \left(\mathrm{RNQS}_t - r_{nqs,t}\right) \times \frac{\mathrm{nqs}_{t-1}}{\mathrm{nav}_{t-1}} + \left(\mathrm{RNUS}_t - r_{nus,t}\right) \times \frac{\mathrm{nus}_{t-1}}{\mathrm{nav}_{t-1}} - \\
&- \left(r_{nqs,t} \times \left(\frac{\mathrm{MV(nqs)}_{t-1}}{\mathrm{MV(nop)}_{t-1}} - \frac{\mathrm{nqs}_{t-1}}{\mathrm{nop}_{t-1}} \right) + r_{nus,t} \times \left(\frac{\mathrm{MV(nus)}_{t-1}}{\mathrm{MV(nop)}_{t-1}} - \frac{\mathrm{nus}_{t-1}}{\mathrm{nop}_{t-1}} \right) \right)
\end{aligned} \tag{A3.27}$$

Note that the weights on returns on the two sub-portfolios have to sum to 1 and the same holds for the weights for the required rates of returns. Using that in A3.27 gives

$$
\begin{aligned}
& r_{nqs,t} \times \left(\frac{\mathrm{MV}(\mathrm{nqs})_{t-1}}{\mathrm{MV}(\mathrm{nop})_{t-1}} - \frac{\mathrm{nqs}_{t-1}}{\mathrm{nop}_{t-1}} \right) + r_{nus,t} \times \left(\frac{\mathrm{MV}(\mathrm{nus})_{t-1}}{\mathrm{MV}(\mathrm{nop})_{t-1}} - \frac{\mathrm{nus}_{t-1}}{\mathrm{nop}_{t-1}} \right) = \\
& = r_{nqs,t} \times \left(\frac{\mathrm{MV}(\mathrm{nqs})_{t-1}}{\mathrm{MV}(\mathrm{nop})_{t-1}} - \frac{\mathrm{nqs}_{t-1}}{\mathrm{nop}_{t-1}} \right) + r_{nus,t} \times \left(1 - \frac{\mathrm{MV}(\mathrm{nqs})_{t-1}}{\mathrm{MV}(\mathrm{nop})_{t-1}} - 1 + \frac{\mathrm{nqs}_{t-1}}{\mathrm{nop}_{t-1}} \right) = \\
& = r_{nqs,t} \times \left(\frac{\mathrm{MV}(\mathrm{nqs})_{t-1}}{\mathrm{MV}(\mathrm{nop})_{t-1}} - \frac{\mathrm{nqs}_{t-1}}{\mathrm{nop}_{t-1}} \right) - r_{nus,t} \times \left(\frac{\mathrm{MV}(\mathrm{nqs})_{t-1}}{\mathrm{MV}(\mathrm{nop})_{t-1}} - \frac{\mathrm{nqs}_{t-1}}{\mathrm{nop}_{t-1}} \right) = \\
& = \left(r_{nqs,t} - r_{nus,t} \right) \times \left(\frac{\mathrm{MV}(\mathrm{nqs})_{t-1}}{\mathrm{MV}(\mathrm{nop})_{t-1}} - \frac{\mathrm{nqs}_{t-1}}{\mathrm{nop}_{t-1}} \right)
\end{aligned}
\tag{A3.28}
$$

and

$$
\begin{aligned}
& \mathrm{RR}_{\mathrm{noa},t} = \mathrm{RNOA}_t - r_{u,t} = \\
& = \left(\mathrm{RNQS}_t - r_{nqs,t} \right) \times \frac{\mathrm{nqs}_{t-1}}{\mathrm{nav}_{t-1}} + \left(\mathrm{RNUS}_t - r_{nus,t} \right) \times \frac{\mathrm{nus}_{t-1}}{\mathrm{nav}_{t-1}} - \\
& - \left(\left(r_{nqs,t} - r_{nus,t} \right) \times \left(\frac{\mathrm{MV}(\mathrm{nqs})_{t-1}}{\mathrm{MV}(\mathrm{nop})_{t-1}} - \frac{\mathrm{nqs}_{t-1}}{\mathrm{nop}_{t-1}} \right) \right) = \\
& = \mathrm{RR}_{\mathrm{nqs},t} \times \frac{\mathrm{nqs}_{t-1}}{\mathrm{nav}_{t-1}} + \mathrm{RR}_{\mathrm{nus},t} \times \frac{\mathrm{nus}_{t-1}}{\mathrm{nav}_{t-1}} - \\
& - \left(\left(r_{nqs,t} - r_{nus,t} \right) \times \left(\frac{\mathrm{MV}(\mathrm{nqs})_{t-1}}{\mathrm{MV}(\mathrm{nop})_{t-1}} - \frac{\mathrm{nqs}_{t-1}}{\mathrm{nop}_{t-1}} \right) \right)
\end{aligned}
\tag{A3.29}
$$

where

$\mathrm{RR}_{\mathrm{nqs},t} = \left(\mathrm{RNQS}_t - r_{nqs,t} \right) =$ residual return on quoted secruities in period t (A3.30)

$\mathrm{RR}_{\mathrm{nus},t} = \left(\mathrm{RNUS}_t - r_{nus,t} \right) =$ residual return on unquoted secruities in period t (A3.31)

Inserting A3.29 into A3.22 gives a final expression for the residual return contribution from net asset value based on the contribution from each sub-portfolio, financing, incurred administrative expenses, taxes and an extended aggregation error.

$$\mathrm{RNAV}_t - r_{E,t} = \begin{bmatrix} \mathrm{RR}_{\mathrm{noa,t}} \times \left(1 + \frac{\mathrm{nfl}_{t-1}}{\mathrm{nav}_{t-1}}\right) - \mathrm{RR}_{\mathrm{nfl,t}} \times \frac{\mathrm{nfl}_{t-1}}{\mathrm{nav}_{t-1}} - \\ - \mathrm{RRC}_{\mathrm{tax,t}} - \mathrm{RRC}_{\mathrm{adm,t}} - \mathrm{AE}_t \end{bmatrix} =$$

$$= \begin{bmatrix} \mathrm{RR}_{\mathrm{nqs,t}} \times \frac{\mathrm{nqs}_{t-1}}{\mathrm{nav}_{t-1}} + \mathrm{RR}_{\mathrm{nus,t}} \times \frac{\mathrm{nus}_{t-1}}{\mathrm{nav}_{t-1}} - \\ - \left(\left(r_{nqs,t} - r_{nus,t}\right) \times \left(\frac{\mathrm{MV(nqs)}_{t-1}}{\mathrm{MV(nop)}_{t-1}} - \frac{\mathrm{nqs}_{t-1}}{\mathrm{nop}_{t-1}} \right)\right) \end{bmatrix} \left(1 + \frac{\mathrm{nfl}_{t-1}}{\mathrm{nav}_{t-1}}\right) - \tag{A3.32}$$

$$- \mathrm{RR}_{\mathrm{nfl,t}} \times \frac{\mathrm{nfl}_{t-1}}{\mathrm{nav}_{t-1}} - \mathrm{RRC}_{\mathrm{tax,t}} - \mathrm{RRC}_{\mathrm{adm,t}} - \mathrm{AE}_t =$$

$$= \left[\mathrm{RR}_{\mathrm{nqs,t}} \times \frac{\mathrm{nqs}_{t-1}}{\mathrm{nav}_{t-1}} + \mathrm{RR}_{\mathrm{nus,t}} \times \frac{\mathrm{nus}_{t-1}}{\mathrm{nav}_{t-1}} \right] \left(1 + \frac{\mathrm{nfl}_{t-1}}{\mathrm{nav}_{t-1}}\right) -$$

$$- \mathrm{RR}_{\mathrm{nfl,t}} \times \frac{\mathrm{nfl}_{t-1}}{\mathrm{nav}_{t-1}} - \mathrm{RRC}_{\mathrm{tax,t}} - \mathrm{RRC}_{\mathrm{adm,t}} - \mathrm{EAE}_t =$$

$$= \mathrm{RRC}_{\mathrm{nqs,t}} + \mathrm{RRC}_{\mathrm{nus,t}} - \mathrm{RRC}_{\mathrm{nfl,t}} - \mathrm{RRC}_{\mathrm{tax,t}} - \mathrm{RRC}_{\mathrm{adm,t}} - \mathrm{EAE}_t$$

where

$$\mathrm{RRC}_{\mathrm{nqs,t}} = \left(\mathrm{RNQS}_t - r_{nqs,t}\right) \times \frac{\mathrm{nqs}_{t-1}}{\mathrm{noa}_{t-1}} \times \left(1 + \frac{\mathrm{nfl}_{t-1}}{\mathrm{nav}_{t-1}}\right) = \tag{A3.33}$$

= residual return contribution from net quoted securities

$$\mathrm{RRC}_{\mathrm{nus,t}} = \left(\mathrm{RNUS}_t - r_{nus,t}\right) \times \frac{\mathrm{nus}_{t-1}}{\mathrm{noa}_{t-1}} \times \left(1 + \frac{\mathrm{nfl}_{t-1}}{\mathrm{nav}_{t-1}}\right) = \tag{A3.34}$$

= residual return contribution from net unquoted securities

$$\mathrm{RRC}_{\mathrm{nfl,t}} = \left(\mathrm{RNFL}_t - r_{nfl,t}\right) \times \frac{\mathrm{nfl}_{t-1}}{\mathrm{nav}_{t-1}} = \tag{A3.35}$$

= residual return contribution from net financial liabilities

$$\begin{aligned} \mathrm{EAE}_t = {} & \left(r_{nqs,t} - r_{nus,t}\right) \times \left(\frac{\mathrm{MV(nqs)}_{t-1}}{\mathrm{MV(noa)}_{t-1}} - \frac{\mathrm{nqs}_{t-1}}{\mathrm{noa}_{t-1}} \right) \times \left(1 + \frac{\mathrm{nfl}_{t-1}}{\mathrm{nav}_{t-1}}\right) \\ & + \left(r_{u,t} - r_{ND,t}\right) \times \left(\frac{\mathrm{ND}_{t-1}}{\mathrm{E}_{t-1}} - \frac{\mathrm{nfl}_{t-1}}{\mathrm{nav}_{t-1}} \right) \end{aligned} \tag{A3.36}$$

= extended aggregation error

(A3.32) can now be inserted into (A3.13) to obtain a model for the premium on closed-end investment companies based on the residual return contributions from net quoted securities, net unquoted securities, net financial liabilities, administrative expenses, taxes and an extended aggregation error.

$$\mathrm{Premium}_0 = \sum_{t=1}^{H} \left(\prod_{\tau=1}^{t} (1 + r_{E,\tau}) \right)^{-1} \times \begin{pmatrix} \mathrm{R\tilde{R}C}_{\mathrm{nqs,t}} + \mathrm{R\tilde{R}C}_{\mathrm{nus,t}} - \mathrm{R\tilde{R}C}_{\mathrm{nfl,t}} - \\ - \mathrm{R\tilde{R}C}_{\mathrm{tax,t}} - \mathrm{R\tilde{R}C}_{\mathrm{adm,t}} - \mathrm{EAE}_{\mathrm{t}} \end{pmatrix} \times \tilde{\mathrm{G}}_{\mathrm{t-1}} +$$
$$+ \left(\prod_{\tau=1}^{H} (1 + r_{E,\tau}) \right)^{-1} \times \mathrm{Pre\tilde{m}ium}_{\mathrm{H}} \times \tilde{\mathrm{G}}_{\mathrm{H}}$$

(A3.37)

Appendix 5.1 The tax laws for Swedish closed-end investment companies 1972 - 2004

The structure of corporate taxes for closed-end investment companies in Sweden has changed substantially over these years. The changes can be divided into two groups, namely those that are related to the tax rate and those that are related to the tax base. The most important restructure occurred in 1991, when the entire Swedish tax system was reshaped in order to simplify and diminish taxes. Below I present the major characteristics of the tax rules for closed-end investment companies during the period. Emphasis is put on the rules for capital gains/losses and dividend revenues. I have divided the full period into six sub-periods, due to important changes. The lengths of the periods are presented in figure A.5.1.1.

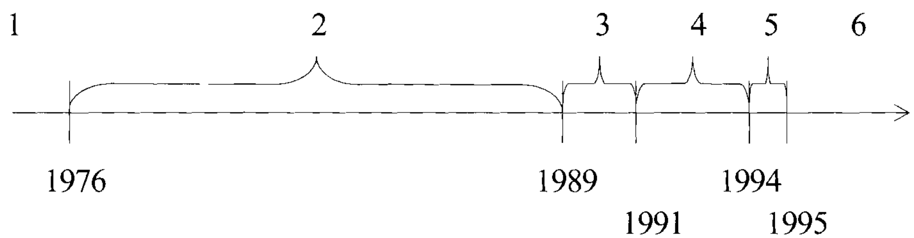

Figure A5.1.1: Periods with stable tax laws for closed-end investment companies in Sweden 1972 - 1997

Period 1: Prior to 1976

Tax base

Prior to 1976, the main rule was that all capital gains on shares were treated equally, independent of the time of ownership by the company. This means that the difference between the realized revenue from the sale of the share minus the acquisition cost was the taxable capital gain. However, due to the tax rules prior to 1966, the taxable capital gain on shares held for more than 5 years was equal to 10 % of the realized revenue. It is worth noting that the corporate tax base for capital gains was determined in the same manner as the personal tax base.

Dividend revenues were taxable but if the closed-end investment company distributed at least 80 % of these revenues, all dividend revenues were excluded from taxable income.

Tax rate

During this period all closed-end investment companies were liable to both state tax and municipal tax. The municipal tax incurred was deductible for state tax the following year. Runsten (1998) presents a table of the corporate tax rate for the period 1967 – 1993, which is calculated using the following equation:

$$\hat{\tau}_t = \bar{\tau}_{m,t} + \tau_{s,t} \cdot \left(1 - \bar{\tau}_{m,t}\right)$$

where

$\hat{\tau}_t$ = estimated corporate tax rate for year t

$\bar{\tau}_{m,t}$ = average municipal tax rate for year t

$\tau_{s,t}$ = state tax rate for year t

According to this model the corporate tax rate during the period 1972-1975 was 54 % to 56 %.

Period 2: 1976 – 1989

Tax base

In 1976 the design of capital gains tax for shares was thoroughly changed. A separation between short-term and long-term investments was introduced. Short-term investments were those where the investor had owned the security for no more than 2 years and long-term investments all the others. Capital gains on short-term investments were 100 % taxable, while only 40 % of capital gains on long-term investments were taxable. Generally, the average acquisition cost was used in calculating capital gains. A standard acquisition cost equal to 25 % of realized revenues from the sale could be used for long-term investments. Some more detailed acquisition cost alternatives existed too, but they will not be presented here.

There was no change in the tax base for dividend revenues.

Tax rate

The level of the effective tax rate was approximately the same during the entire period, ranging from 56 to 58 %. The structure of the tax rate changed in 1984 due to two separate transformations. The first one was that companies no longer paid any municipal tax from 1984 and onwards. In order to compensate for the elimination of the municipal tax the state tax rate was raised from 40 % prior to 1983 to 52 % from 1984. The second one was the introduction of a profit sharing tax in 1984. Effectively it increased the rate by approximately 5 percentage points.

Period 3: 1990

Tax base

In 1990, the taxable capital gains for investments made for longer than 2 years were raised to 50 % from 40 %.

Tax rate

In 1989 the state tax rate was decreased to 40 %. This level lasted for two years. The profit sharing tax still existed during this period, which led to an effective tax rate of approximately 45 % during these two years.

Period 4: 1991 – 1993

Tax base

In 1991, a very thorough tax reform was launched in Sweden. It had severe effects of all taxable entities, including closed-end investment companies. The target was to eliminate the so-called double taxation, where indirect investments through an investment company were taxed twice, both at the investment company level and at the investor level. From 1991, capital gains are no longer taxable for closed-end investment companies. Simultaneously, a standard revenue of 2 % of the market value of shares in the portfolio at the beginning of the year was added to taxable income. This was done in order to eliminate savings effects within the company relative to direct ownership of the portfolio.

Dividend revenues became taxable, but distributed dividends were tax deductible as long as a taxable deficit did not occur.

Tax rate

The tax rate was reduced to 30 % for all companies.

Period 5: 1994

Tax base

During 1994, all dividend revenues became non-taxable. This was effective for both companies, including closed-end investment companies, and individuals. Since, tax exempt dividend revenues combined with tax exempt capital gains in investment companies led to a possibility channel untaxed capital gains directly to the individual investor, a maximum level of tax-exempt distributed dividends was installed[1]. 40 % of the amount of dividends above that threshold was considered taxable income.

Moreover, the standard revenue on Swedish shares was reduced to 1 % of the market value at the beginning of the year, while it was still 2 % for foreign shares.

Tax rate

The rate was reduced to 28 %.

Period 6: 1995 onwards

Tax base

[1] The maximum level was determined as taxable revenues minus tax deductible expenses and estimated taxes plus non-taxable dividend revenues.

The rules that were in place between 1991 and 1993 were reinstalled.

Tax rate

The tax rate remains at 28 %

Conclusions

Obviously, the taxes a closed-end investment company has paid have changed over the years. The table below shows a range of the expected percentage of total assets that would be paid in taxes each year during the various periods.

	-1975	1976-1989	1990	1991-1993	1994	1995-
Percentage of portfolio of shares	0.3 – 3.8 (1.4)	1.2 – 4.0 (2.0)	1.1 - 3.2 (1.7)	0 – 0 (0)	0 – 0 (0)	0 – 0 (0)

Table 5.1: **Expected yearly taxes as a percentage of the market value of the portfolio of shares at the beginning of the period**[2] The limits of the range show maximum and minimum levels given certain standard values. The figure within parenthesis is a value for the case where 30 % of the portfolio consists of short-term investments and 70 % of the portfolio consists of long-term investments.

[2] $$\text{Percentage} = \text{TR} \bullet \begin{bmatrix} \text{PLT} \bullet \text{TSL} \bullet \left(1 + \text{CG} - (1 + \text{CG})^{1/\text{TOH}^{-1}}\right) + \\ + \text{PHT} \bullet \text{TSH} \bullet \left(1 + \text{CG} - (1 + \text{CG})^{1/\text{TOL}^{-1}}\right) \end{bmatrix}$$

Assumptions and notation

- yearly share price increase 7 %, i.e. capital gains rate CG;
- sufficient dividends are distributed to benefit from tax exemption on dividend revenues;
- one part of the portfolio has a turnover of 1, TOH;
- one part of the portfolio has a turnover of 0.2, TOL;
- tax rate is period specific , TR
- taxable share of low turnover portfolio, TSL, and high turnover portfolio, TSH, is period specific
- PLT and PHT is percentage of total portfolio in low and high turnover portfolios respectively

Appendix 6.1 Swedish Closed-End Investment Companies in sample

Name	All companies	Sphere companies	Pure companies
Argentus	X		
Aritmos	X		
Almedahl	X		
Asken	X		
Bacho/Promotion	X	X	
Beijer	X		
Borås Invest	X		
Cardo	X	X	
Carnegie	X		
Custos	X	X	X
Eken	X		
Export-Invest	X	X	X
Företagsfinans	X	X	X
Geveko	X		
Gorthon	X		
Industrivärden	X	X	Some years
Investor	X	X	Some years
Kinnevik	X		X
Latour/Hevea	X	X	Some years
Protorp	X	X	X
Providentia	X	X	X
Rang Invest/Eiser	X		X
Ratos	X	X	
Säfveån	X	X	
Öresund	X	X	X

Table A6.1.1: Some of the companies have changed their status from being a pure closed-end investment company, but they still remain closed-end investment companies. These cases are indicated by “some years”.

Appendix 6.2 British Investment Trusts in sample

Name	Name
Aberdeen Emerging Markets	GT Japan
Aberdeen European	Henderson Electric
Aberdeen High Income	Henderson Far East
Aberdeen Latin America	Henderson High Income
Aberdeen New Dawn	Henderson Japanese Smaller Companies
Aberdeen New Thai	Henderson Smaller Companies
Aberforth Smaller Companies	Henderson Strata
Albany	Henderson Trust Pacific
Alliance	Herald
American Opportunities	Hotspur
Anglo & Overseas	International Biotech
Asian Tech Trust	Invesco City
Asset Management	Invesco Convertible
Australian Opportunities	Invesco England and International
Baille Japan	Invesco Enterprise
Bankers	Invesco Korea
Barings	Invesco Recovery
Baronsmead	Investor Capital
Beta Global Emerging Markets	I&S UK Smaller Companies
British & American	Jersey Phoenix
British Assets	Jupiter Extra Income
British Empire	Jupiter European
Brittannic Smaller Companies	Jupiter International Green
Brunner	Jupiter Primadonna
BZW	Jupiter Split
Candover	Knox D'Arcy
Capital Gearing	Law and Debenture
Charter European	Leggmason European Utilities
City Merchant High Yield	Lloyds Smaller Companies
City of London	London & St Lawrence
City of Oxford	Lowland
Currie Japan	Majedie
Currie Moorgate	Merchant
Currie Smaller Companies	Merrill Lynch UK
Dartmoor	Merrill Lynch World Management
Deutsche Equity Income Trust	Mithras

APPENDIX 6.2
British Investment Trusts in sample

Dresdner Emerging Markets	Monks
Dresdner Smaller Companies	Montanaro
Dunedin Enterprise	Murray International
Dunedin Growth Income	Murray Global Return
Dunedin Smaller Companies	Murray Income
Eaglet	Murray vct
East Germany	Mid Wynd International
Edinburgh Dragon	Natwest Enterprise
Edinburgh Inca	New Zealand
Edinburgh Income Ordinary	North Atlantic Smaller Companies
Edinburgh Investment Trust	Northern Investors
Edinburgh Japan	Northern Venture
Edinburgh Java	Olim Convertibles
Edinburgh New Tiger	Pacific Horizon
Edinburgh Smaller Companies	Pantheon International
Edinburgh UK	Perpetual Japan
Edinburgh US	Personal Assets
Electra	Premium Trust
Enterprise	Quarterly High
Euroland	Radiotrust/Media Income
European Assets	Rit Capital
Foreign & Colonial	Schroeder Asiapacific
Foreign & Colonial Eurotrust	Schroeder Income & Growth
Foreign & Colonial Emerging Markets	Schroeder Japan Growth
Foreign & Colonial Income Growth	Schroeder Korea
Foreign & Colonial Latin America	Schroeder UK Growth
Foreign & Colonial Pacific	Scottish American
Foreign & Colonial Private Equity	Scottish Asian
Foreign & Colonial Smaller Companies	Scottish Investment
Foreign & Colonial US Smaller Companies	Scottish Mortgage
Fidelity European	Scottish Oriental Smaller Companies
Fidelity Special Values	Scottish Value
Finsbury	Second Alliance
Finsbury Pharma	Shires Smaller Companies
Finsbury Smaller Companies	Siam Selective
Finsbury Technology	Smaller Companies
Fleming Chinese	Special Utilities
Fleming Claverhouse	SR Pan European

Fleming Continental European	Templeton Bar
Fleming Emerging Markets	Templeton Emerging Markets
Fleming Enterprise	Templeton Latin America
Fleming Income & Capital	Throgmorton
Fleming Indian	TR European Growth
Fleming Japan	Tribune
Fleming Mercantile	Trust of Property
Fleming Overseas	Turkey
Fleming Smaller Companies	US Smaller Companies
Fleming Technology	Value & Income
Fleming US Discovery	Warrants & Value
Framlington Innovative Growth	Welsh
Gartmore British Income & Growth	Wigmore
Gartmore Emerging Markets	Witan
Gartmore European	World
Gartmore Irish Smaller Companies	3I Group
Gartmore Scotland	3I Select
Gartmore Shared Equity	3I Small
Gartmore Smaller Companies	
German Smaller Companies	
Glasgow	
Govett Asian	
Govett Emerging Markets	
Govett Singapore Growth	
Govett Strategic	
Group	

Appendix 6.3 Descriptive Statistics, market risk adjustment for residual return contributions

Table A6.3.1 contains descriptive statistics for all observations in the sample.
Table A6.3.2 contains descriptive statistics for the observations included in the regression.

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel A: Firm-year observations December 1972 - December 2004				
Premium	-0.228*** (-0.250)	-0.144*** (-0.153)	-0.239*** (-0.260)	-0.239*** (-0.250)
	0.202	0.112	0.161	0.113
Residual return contribution from net asset value, $\left(\mathrm{RRC}_{\mathrm{nav}}^{\mathrm{eat}}\right)$	-0.023* (0.003)	0.004 (-0.002)	-0.022 (0.004)	-0.015 (0.008)
	0.246	0.221	0.226	0.190
Residual return contribution quoted securities, $\left(\mathrm{RRC}_{\mathrm{nqs}}\right)$	-0.002 (-0.001)		-0.005 (-0.005)	-0.010 (-0.005)
	0.156		0.148	0.152
Residual return contribution unquoted securities, $\left(RRC_{nus}\right)$	-0.021** (0.002)		-0.017* (0.002)	-0.004 (0.003)
	0.176		0.155	0.092
Residual return contribution: administrative expenses, $\left(\mathrm{RRC}_{\mathrm{adm}}\right)$	0.004*** (0.003)	0.010*** (0.007)	0.003*** (0.002)	0.003*** (0.003)
	0.004	0.009	0.002	0.003
Residual return contribution: taxes, $\left(\mathrm{RRC}_{\mathrm{tax}}\right)$	0.004*** (0.000)	0.006*** (0.004)	0.003*** (0.000)	0.004*** (0.000)
	0.010	0.006	0.008	0.011
Interest, RNFL	0.152	0.113	0.117	0.104
Leverage, $\left(\frac{\mathrm{nfl}}{\mathrm{nav}}\right)$	0.106*** (0.014)	0.037*** (0.000)	0.094*** (0.042)	0.096*** (0.033)
	0.187	0.107	0.177	0.196
Unquoted securties	0.247*** (0.191)	0.086*** (0.016)	0.212*** (0.148)	0.112*** (0.077)
	0.230	0.183	0.229	0.118
No obs	**388**	**3102**	**274**	**190**
No of firms	**27**	**217**	**14**	**12**

Table A6.3.1: * statistically significantly different from 0 at the 10 % level, ** at the 5 % level and *** at the 1 % level

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Portfolio concentration, (PCON)	0.478*** (0.435)		0.492*** (0.460)	0.473*** (0.420)
	0.235		0.228	0.244
Percentage of votes	0.366*** (0.330)		0.367*** (0.342)	0.302*** (0.283)
	0.184		0.183	0.154
Percentage of capital	0.292*** (0.236)		0.295*** (0.239)	0.278*** (0.236)
	0.162		0.162	0.155
Votes-to-capital	1.348*** (1.095)		1.303*** (1.107)	1.124*** (1.000)
	0.597		0.429	0.237
No obs	**196**		**167**	**101**
No of firms	**23**		**14**	**11**

Table A6.3.1 cont.

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel B: Firm-year observations July 1981 - December 2004				
Premium	-0.179*** (-0.220)	-0.131*** (-0.143)	-0.212*** (-0.230)	-0.206*** (-0.230)
	0.204	0.108	0.164	0.108
Residual return contribution from net asset value, (RRC_{nav}^{eat})	-0.062*** (-0.041)	0.009** (-0.001)	-0.053*** (-0.032)	-0.051** (-0.029)
	0.274	0.225	0.250	0.217
Residual return contribution quoted securities, (RRC_{nqs})	-0.021* (-0.021)		-0.019 (-0.025)	-0.037** (-0.034)
	0.177		0.168	0.174
Residual return contribution unquoted securities, (RRC_{nus})	-0.041*** (-0.005)		-0.034*** (-0.004)	-0.013 (0.002)
	0.194		0.169	0.104
Residual return contribution: administrative expenses, (RRC_{adm})	0.004*** (0.003)	0.010*** (0.008)	0.003*** (0.003)	0.003*** (0.002)
	0.004	0.010	0 003	0.004
Residual return contribution: taxes, (RRC_{tax})	0.006*** (0.001)	0.006*** (0.005)	0.004*** (0.000)	0.006*** (0.001)
	0.012	0.006	0.008	0.013
Interest, RNFL	0.124	0.117	0.136	0.108
Leverage, $\left(\frac{nfl}{nav}\right)$	0.124*** (0.060)	0.042*** (0.000)	0.118*** (0.060)	0.125*** (0.034)
	0.212	0.112	0.198	0.234
Unquoted securties	0.240*** (0.190)	0.091*** (0.013)	0.193*** (0.148)	0.108*** (0.049)
	0.227	0.193	0.202	0.126
No obs	**268**	**2750**	**202**	**123**
No of firms	**27**	**217**	**14**	**12**

Table A6.3.1 cont.

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Portfolio concentration (PCON)	0.483*** (0.448)	0.165*** (0.135)	0.498*** (0.460)	0.478*** (0.430)
	0.236	0.123	0.228	0.248
Percentage of votes	0.378*** (0.349)		0.381*** (0.357)	0.318*** (0.299)
	0.179		0.178	0.150
Percentage of capital	0.300*** (0.239)		0.306*** (0.247)	0.292*** (0.239)
	0.161		0.160	0.153
Votes-to-capital	1.362*** (1.107)	1	1.317*** (1.123)	1.129*** (1.000)
	0.608		0.436	0.244
Fund manager		0.176*** (0.142)		
1999-2004		0.113		
Beneficial owner		0.114*** (0.097)		
1999-2004		0.082		
No obs	**187**	**407**	**158**	**93**
No of firms	**23**	**98**	**14**	**11**

Table A6.3.1 cont.

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel A: Firm-year observations December 1972 - December 2004				
Premium	-0.217*** (-0.240)	-0.148*** (-0.156)	-0.231*** (-0.240)	-0.222*** (-0.230)
	0.206	0.111	0.168	0.106
Residual return contribution from net asset value, $\left(RRC_{nav}^{eat}\right)$	-0.024* (-0.012)	0.015*** (0.003)	-0.027* (-0.011)	-0.017 (-0.001)
	0.249	0.214	0.233	0.187
Residual return contribution quoted securities, $\left(RRC_{nqs}\right)$	-0.003 (-0.004)		-0.006 (-0.009)	-0.004 (0.005)
	0.165		0.154	0.092
Residual return contribution unquoted securities, $\left(RRC_{nus}\right)$	-0.021** (0.002)		-0.021* (0.002)	-0.012 (-0.016)
	0.177		0.160	0.153
Residual return contribution: administrative expenses, $\left(RRC_{adm}\right)$	0.004*** (0.003)	0.009*** (0.006)	0.003*** (0.003)	0.004*** (0.003)
	0.004	0.009	0.003	0.004
Residual return contribution: taxes, $\left(RRC_{tax}\right)$	0.004*** (0.000)	0.006*** (0.005)	0.003*** (0.000)	0.004*** (0.000)
	0.010	0.007	0.006	0.011
Leverage, $\left(\frac{nfl}{nav}\right)$	0.110*** (0.060)	0.040*** (0.000)	0.098*** (0.050)	0.100*** (0.036)
	0.177	0.096	0.157	0.174
Unquoted securties	0.250*** (0.190)	0.076*** (0.021)	0.216*** (0.147)	0.104*** (0.058)
	0.233	0.159	0.232	0.123
No obs	**286**	**2202**	**217**	**136**
No of firms	**25**	**194**	**13**	**10**

Table A6.3.2: * statistically significantly different from 0 at the 10 % level, ** at the 5 % level and *** at the 1 % level

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Portfolio concentration, (PCON)	0.460*** (0.430)		0.474*** (0.454)	0.450*** (0.402)
	0.223		0.216	0.230
Percentage of votes	0.349*** (0.310)		0.352*** (0.313)	0.284*** (0.265)
	0.179		0.182	0.146
Percentage of capital	0.275*** (0.228)		0.278*** (0.232)	0.260*** (0.231)
	0.152		0.155	0.147
Votes-to-capital	1.336*** (1.123)		1.316*** (1.128)	1.133*** (1.000)
	0.536		0.428	0.244
No obs	**163**		**146**	**89**
No of firms	**19**		**13**	**10**

Table A6.3.2 cont.

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel B: Firm-year observations July 1981 - December 2004				
Premium	-0.182*** (-0.220)	-0.133*** (-0.146)	-0.215*** (-0.230)	-0.205*** (-0.220)
	0.210	0.107	0.170	0.100
Residual return contribution from net asset value, $(\mathrm{RRC}_{\mathrm{nav}}^{\mathrm{eat}})$	-0.029 (-0.024)	0.018*** (0.004)	-0.034* (-0.024)	-0.029* (-0.018)
	0.260	0.221	0.243	0.204
Residual return contribution quoted securities, $(\mathrm{RRC}_{\mathrm{nqs}})$	-0.007 (-0.010)		-0.008 (-0.019)	-0.020 (-0.028)
	0.180		0.167	0.167
Residual return contribution unquoted securities, (RRC_{nus})	-0.020* (-0.003)		-0.024** (-0.003)	-0.008 (0.002)
	0.179		0.161	0.102
Residual return contribution: administrative expenses, $(\mathrm{RRC}_{\mathrm{adm}})$	0.004*** (0.003)	0.010*** (0.007)	0.004*** (0.003)	0.003*** (0.002)
	0.004	0.010	0 003	0.004
Residual return contribution: taxes, $(\mathrm{RRC}_{\mathrm{tax}})$	0.004*** (0.000)	0.006*** (0.005)	0.002*** (0.000)	0.004*** (0.000)
	0.012	0.006	0.007	0.012
Leverage, $\left(\frac{\mathrm{nfl}}{\mathrm{nav}}\right)$	0.122*** (0.067)	0.044*** (0.000)	0.115*** (0.069)	0.123*** (0.039)
	0.195	0.100	0.168	0.195
Unquoted securties	0.227*** (0.177)	0.079*** (0.017)	0.194*** (0.145)	0.103*** (0.041)
	0.218	0.167	0.202	0.130
No obs	**212**	**1963**	**173**	**101**
No of firms	**23**	**194**	**13**	**10**

Table A6.3.2 cont.

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Portfolio concentration (PCON)	0.465*** (0.435)	0.161*** (0.130)	0.480*** (0.460)	0.454*** (0.405)
	0.224	0.126	0.217	0.234
Percentage of votes	0.362*** (0.322)		0.367*** (0.332)	0.300*** (0.289)
	0.175		0.177	0.142
Percentage of capital	0.286*** (0.234)		0.289*** (0.238)	0.274*** (0.236)
	0.150		0.154	0.146
Votes-to-capital	1.352*** (1.125)	1	1.332*** (1.153)	1.140*** (1.029)
	0.547		0.436	0.252
Fund manager		0.180*** (0.137)		
1999-2004		0.128		
Beneficial owner		0.111*** (0.095)		
1999-2004		0.077		
No obs	**154**	**365**	**137**	**81**
No of firms	**19**	**90**	**13**	**10**

Table A6.3.2 cont.

Appendix 6.4 Bivariate correlation 1972 – 2004, market risk adjustment for residual return contributions Swedish data

Pairwise correlations - Swedish data all firms

All variables are measured from December 1972 - December 2004 using the same definitions and dataset as for the descriptive statistics. The added variable M1 is defined V/C times PCON. The residual return contribution measures use no risk adjustment for the calculation of normal returns.

Panel A: Premiums and return measures

	$PREMIUM_0$	$RRC_{nus,t}$	$RRC_{nqs,t}$	$RRC_{adm,1}$	$RRC_{tax,1}$	$RRC_{nav,0}$	$RRC_{nus,1}$	$RRC_{nqs,1}$	$RRC_{nav,t+1}$	$RRC_{nus,2}$	$RRC_{nqs,t+2}$	$RRC_{nav,2}$	$RRC_{nav,hist}$	$RRC_{nus,hist}$
$PREMIUM_0$	1.0000													
$RRC_{nus,0}$	-0.0674	1.0000												
$RRC_{nqs,0}$	0.0262	0.1506**	1.0000											
$RRC_{adm,1}$	0.1274***	-0.0995*	-0.0726	1.0000										
$RRC_{tax,1}$	0.1230***	-0.0947*	-0.1314***	0.0690	1.0000									
$RRC_{nav,0}$	-0.0477	0.8057***	0.6990***	-0.1192**	-0.1543***	1.0000								
$RRC_{nus,1}$	0.1468***	0.1022*	0.0568	-0.1065**	0.1084**	0.0956*	1.0000							
$RRC_{nqs,1}$	-0.0058	-0.0096	0.0036	-0.0477	0.0346	-0.0048	0.1506**	1.0000						
$RRC_{nav,1}$	0.0868*	0.0588	0.0505	-0.1018**	-0.0943*	0.0630	0.8057***	0.6990***	1.0000					
$RRC_{nus,2}$	0.0979*	-0.1052*	-0.0165	-0.0786	0.0498	-0.0865	0.1022*	0.0568	0.0956*	1.0000				
$RRC_{nqs,2}$	-0.0220	-0.0439	-0.1042*	-0.0423	0.0017	-0.0848	-0.0096	0.0036	-0.0048	0.1407**	1.0000			
$RRC_{nav,2}$	0.0600	-0.1117*	-0.0656	-0.0746	0.0386	-0.1177**	0.0588	0.0505	0.0630	0.8008***	0.6977***	1.0000		
$RRC_{nav,hist}$	-0.1079*	0.4465***	0.3445***	-0.1355**	-0.1622***	0.5362***	0.0049	-0.0631	-0.0406	-0.0552	-0.0559	-0.0856	1.0000	
$RRC_{nus,hist}$	-0.1609***	0.5549***	0.0320	-0.1165**	-0.1665***	0.4089***	0.0195	-0.0357	-0.0180	-0.0936	0.0005	-0.0731	0.8039***	1.0000
$RRC_{nqs,hist}$	0.0307	0.0928*	0.5489***	-0.1025*	-0.0948*	0.4013***	0.0001	-0.0854	-0.0440	0.0141	-0.1057*	-0.0514	0.6825***	0.1222**

* statistically significant correlation at the 10 % level, ** at the 5 % level and *** at the 1 % level

Panel B: Premiums and return measures to capital structure and control variables							
	D/NAV	PUS	PCON	VOTES	CAPITAL	V/C	M1
$PREMIUM_0$	0.0304	-0.0572	0.0693*	0.0129	0.0960*	-0.0921***	-0.1291*
$RRC_{nus,0}$	0.0308	0.0076	-0.0436	0.0849	0.1081	-0.0491	-0.0914
$RRC_{nqs,0}$	-0.0960**	0.0185	-0.0057	-0.0229	0.0068	-0.0365	0.0024
$RRC_{adm,1}$	0.0907*	0.1998***	-0.0373	0.0738	-0.1362*	0.2383***	0.1709**
$RRC_{tax,1}$	-0.0856*	0.0147	-0.1491***	-0.0720	-0.0296	-0.0740	-0.1307*
$RRC_{nav,0}$	-0.0320	0.0197	-0.0514	0.0140	0.0444	-0.0430	-0.0679
$RRC_{nus,1}$	-0.0482	-0.1829***	-0.0848	0.0669	0.0930	-0.0983	-0.1909***
$RRC_{nqs,1}$	-0.0313	0.0369	-0.0034	0.0391	0.0932	-0.0672	0.0286
$RRC_{nav,1}$	-0.0577	-0.1090**	-0.0811	0.0493	0.0979	-0.0912	-0.1171
$RRC_{nus,2}$	0.0128	-0.2263***	-0.0260	0.0352	0.0942	-0.1637**	-0.1711**
$RRC_{nqs,2}$	0.0494	0.0242	-0.0044	0.0416	0.1021	-0.0658	0.0431
$RRC_{nav,2}$	0.0486	-0.1463***	-0.0414	0.0388	0.1118	-0.1479*	-0.1157
$RRC_{nav,hist}$	-0.0162	0.0302	0.0516	0.0556	0.0932	0.0024	0.1188
$RRC_{nus,hist}$	0.0974*	0.0316	0.0658	0.0510	0.0498	0.0317	0.1415*
$RRC_{nqs,hist}$	-0.0736	0.0242	0.0620	0.0492	0.1221	-0.0868	0.0293
D/NAV	1.0000	0.1515***	0.2300***	0.0476	0.0974	-0.0313	0.1088
PUS		1.0000	0.0217	0.1212*	-0.0599	0.3044***	0.4123***
PCON			1.0000	0.4574***	0.5396***	-0.0255	0.5881***
VOTES				1.0000	0.7853***	0.1837***	0.3060***
CAPITAL					1.0000	-0.3276***	0.0246
V/C						1.0000	0.7087***
M1							1.0000

Pairwise correlations - Swedish data sphere firms

All variables are measured from December 1972 - December 2004 using the same definitions and dataset as for the descriptive statistics. The added variable M1 is defined V/C times PCON. The residual return contribution measures use no risk adjustment for the calculation of normal returns.

Panel A: Premiums and return measures

	$PREMIUM_0$	$RRC_{nus,t}$	$RRC_{nqs,t}$	$RRC_{adm,1}$	$RRC_{tax,1}$	$RRC_{nav,0}$	$RRC_{nus,1}$	$RRC_{nqs,1}$	$RRC_{nav,t+1}$	$RRC_{nus,2}$	$RRC_{nqs,t+2}$	$RRC_{nav,2}$	$RRC_{nav,hist}$	$RRC_{nus,hist}$
$PREMIUM_0$	1.0000													
$RRC_{nus,0}$	-0.1814***	1.0000												
$RRC_{nqs,0}$	0.0244	0.1456**	1.0000											
$RRC_{adm,1}$	0.1865***	-0.0580	0.0234	1.0000										
$RRC_{tax,1}$	0.0591	-0.0173	-0.1410**	0.0781	1.0000									
$RRC_{nav,0}$	-0.1110*	0.7681***	0.7377	-0.0558	-0.0964	1.0000								
$RRC_{nus,1}$	0.0880	0.0976	0.0894	-0.0935	0.0666	0.0998	1.0000							
$RRC_{nqs,t}$	0.0303	-0.0625	0.0259	-0.0406	0.0716	-0.0134	0.1456**	1.0000						
$RRC_{nav,1}$	0.0744	0.0195	0.0907	-0.0766	0.0645	0.0554	0.7681***	0.7377***	1.0000					
$RRC_{nus,2}$	0.0075	-0.0169	0.0421	0.0168	0.0268	0.0148	0.0976	0.0894	0.0998	1.0000				
$RRC_{nqs,2}$	-0.0659	-0.0618	-0.0494	-0.0647	0.0065	-0.0726	-0.0625	0.0259	-0.0134	0.1388**	1.0000			
$RRC_{nav,2}$	-0.0443	-0.0575	0.0009	-0.0152	0.0200	-0.0392	0.0195	0.0907	0.0554	0.7648***	0.7364***	1.0000		
$RRC_{nav,hist}$	-0.1421**	0.4859***	0.3536***	-0.1182*	-0.0835	0.5604***	0.0533	-0.0859	-0.0209	-0.0553	-0.1113	-0.1139	1.0000	
$RRC_{nus,hist}$	-0.2678***	0.5877***	0.0000	-0.1005	-0.0638	0.3950***	0.0542	-0.0744	-0.0167	-0.0931	-0.0439	-0.0964	0.7735***	1.0000
$RRC_{nqs,hist}$	0.0389	0.1435**	0.5639***	-0.0807	-0.1080*	0.4572***	0.0484	-0.0764	-0.0083	0.0267	-0.1356**	-0.0558	0.7361***	0.1481**

* statistically significant correlation at the 10 % level, ** at the 5 % level and *** at the 1 % level

Panel B: Premiums and return measures to capital structure and control variables							
	D/NAV	PUS	PCON	VOTES	CAPITAL	V/C	M1
$PREMIUM_0$	0.0338	0.0661	0.2362***	0.0255	0.1640**	-0.2071***	0.0015
$RRC_{nus,0}$	-0.0427	0.0140	-0.0437	0.0600	0.0853	-0.0493	-0.0550
$RRC_{nqs,0}$	-0.1095*	0.0030	-0.0171	-0.0328	0.0208	-0.0842	-0.0482
$RRC_{adm,1}$	0.1217**	0.1989***	0.0000	0.2067***	-0.1280*	0.4698***	0.3279***
$RRC_{tax,1}$	-0.0755	-0.0378	-0.0711	-0.0138	-0.0147	0.0000	-0.0971
$RRC_{nav,0}$	-0.0896	0.0203	-0.0606	-0.0172	0.0342	-0.0818	-0.0836
$RRC_{nus,1}$	-0.0955	-0.1813***	-0.1138*	0.0653	0.0760	-0.0002	-0.1791**
$RRC_{nqs,t}$	-0.0443	0.0106	0.0278	0.0365	0.0720	-0.0471	0.0514
$RRC_{nav,1}$	-0.0960	-0.1080*	-0.0793	0.0435	0.0756	-0.0378	-0.0971
$RRC_{nus,2}$	0.0181	-0.2171***	-0.0124	0.0196	0.0619	-0.0543	-0.0138
$RRC_{nqs,2}$	0.0189	-0.0109	0.0198	0.0447	0.0969	-0.0613	0.0470
$RRC_{nav,2}$	0.0386	-0.1498**	-0.0148	0.0290	0.0898	-0.0841	-0.0180
$RRC_{nav,hist}$	-0.0888	-0.0158	0.0585	0.0484	0.1150	-0.1159	0.0528
$RRC_{nus,hist}$	0.0339	-0.0313	0.0556	0.0206	0.0279	-0.0593	0.0752
$RRC_{nqs,hist}$	-0.0944	-0.0002	0.0704	0.0612	0.1568**	-0.1206	0.0230
D/NAV	1.0000	0.1494***	0.1200**	0.0063	0.0056	0.0586	0.1249*
PUS		1.0000	0.0961	0.1109	-0.0545	0.2592***	0.3409***
PCON			1.0000	0.5029***	0.5988***	-0.1185	0.7525***
VOTES				1.0000	0.8026***	0.3431***	0.5803***
CAPITAL					1.0000	-0.2550***	0.2791***
V/C						1.0000	0.5050***
M1							1.0000

Pairwise correlations - Swedish data pure investment companies

All variables are measured from December 1972 - December 2004 using the same definitions and dataset as for the descriptive statistics. The added variable M1 is defined V/C times PCON. The residual return contribution measures use no risk adjustment for the calculation of normal returns.

Panel A: Premiums and return measures

	$PREMIUM_0$	$RRC_{nus,t}$	$RRC_{ngs,t}$	$RRC_{adm,1}$	$RRC_{tax,1}$	$RRC_{nav,0}$	$RRC_{nus,1}$	$RRC_{ngs,1}$	$RRC_{nav,1}$	$RRC_{nus,2}$	$RRC_{ngs,t+2}$	$RRC_{nav,2}$	$RRC_{nav,hist}$	$RRC_{nus,hist}$
PREMIUM	1.0000													
$RRC_{nus,t}$	-0.0663	1.0000												
$RRC_{ngs,t}$	-0.0267	0.1718**	1.0000											
$RRC_{adm,t+1}$	0.2194**	0.0068	0.0153	1.0000										
$RRC_{tax,t+1}$	0.1578**	0.0274	-0.1546**	0.1102*	1.0000									
$RRC_{nav,t}$	-0.0681	0.6682***	0.8400***	0.0116	-0.0913	1.0000								
$RRC_{nus,t+1}$	0.0014	-0.0781	0.0269	-0.0847	-0.1147*	-0.0389	1.0000							
$RRC_{ngs,t+1}$	0.0398	-0.1205	0.0266	-0.1158*	0.0690	0.0229	0.1718**	1.0000						
$RRC_{nav,t+1}$	0.0089	-0.1515	0.0545	-0.1325**	-0.0829**	0.0446	0.6682***	0.8400***	1.0000					
$RRC_{nus,t+2}$	0.0276	-0.1378*	0.1162*	-0.0087	0.0280	0.0189	-0.0781	0.0269	-0.0389	1.0000				
$RRC_{ngs,t+2}$	-0.0903	-0.0876	-0.0084	-0.0550	0.0332	-0.0511	-0.1205*	0.0266	0.0229	0.1718**	1.0000			
$RRC_{nav,t+2}$	-0.0796	-0.1635**	0.0600	-0.0275	0.0376	-0.0397	-0.1515**	0.0545	-0.0446	0.6682***	0.8400***	1.0000		
$RRC_{nav,hist}$	-0.0245	0.3720***	0.4494***	-0.0901	-0.1216	0.5401***	0.0000	-0.0482	-0.0433	0.0284	-0.0648	-0.0436	1.0000	
$RRC_{nus,hist}$	-0.1345	0.5269***	-0.0561	-0.1740**	-0.0855	0.2216***	-0.1117	-0.0763	-0.1445*	-0.0387	0.0416	-0.0052	0.5592***	1.0000
$RRC_{ngs,hist}$	0.0153	0.1467**	0.5810***	0.0062	-0.1312*	0.5174***	0.0759	-0.0447	0.0219	0.0603	-0.1199*	-0.0393	0.8802***	0.1112

Panel B: Premiums and return measures to capital structure and control variables							
	D/NAV	PUS	PCON	VOTES	CAPITAL	V/C	M
PREMIUM	0.0858	0.0683	0.2901***	0.2296**	0.2524***	-0.0418	0.1398
$RRC_{nus,t}$	-0.0721	0.1548**	-0.0714	0.0462	0.0796	-0.0342	-0.1055
$RRC_{nqs,t}$	-0.1432**	-0.0176	0.0044	-0.0020	0.0479	-0.1143	-0.0219
$RRC_{adm,t+1}$	0.0997	0.0874	-0.1412**	0.0508	-0.1640*	0.2590***	-0.0026
$RRC_{tax,t+1}$	-0.0611	-0.0278	-0.0989	0.0405	0.0260	0.1372	0.0602
$RRC_{nav,t}$	-0.1428**	0.0931	-0.0839	-0.0198	0.0362	-0.0944	-0.0998
$RRC_{nus,t+1}$	-0.0770	-0.1414**	-0.0730	0.0210	0.0474	-0.0267	-0.1069
$RRC_{nqs,t+1}$	-0.0309	0.0213	0.0466	0.0846	0.1024	-0.0596	0.0870
$RRC_{nav,t+1}$	-0.0733	-0.0535	-0.0257	0.0579	0.0788	-0.0562	-0.0028
$RRC_{nus,t+2}$	0.0472	-0.1043	0.0246	-0.0076	0.0366	-0.0519	-0.0539
$RRC_{nqs,t+2}$	0.0097	-0.052	0.0192	0.0717	0.1047	-0.0730	0.0336
$RRC_{nav,t+2}$	0.0545	-0.0516	0.0087	0.0402	0.0779	-0.0796	-0.0263
$RRC_{nav,hist}$	-0.2189***	0.0581	0.0166	0.1079	0.1577*	-0.0860	-0.0146
$RRC_{nus,hist}$	-0.0241	0.0658	0.0014	0.0176	0.0380	0.0022	-0.0439
$RRC_{nqs,hist}$	-0.1404**	0.0112	0.0736	0.1263	0.1865**	-0.1216	0.0357
D/NAV	1.0000	0.3777***	0.1146*	-0.0143	-0.0281	0.1136	0.1408
PUS		1.0000	0.0783	-0.0716	-0.0663	0.0497	0.1262
PCON			1.0000	0.6028***	0.6514***	-0.1267	0.8286***
VOTES				1.0000	0.9108***	0.1333	0.5875***
CAPITAL					1.0000	-0.2640***	0.4147***
V/C						1.0000	0.4190
M							1.0000

Appendix 6.5 Bivariate correlation 1972 – 2004, market risk adjustment for residual return contributions British data

Pairwise correlations - British data all firms													
All variables are measured from December 1972 - December 2004 using the same definitions and dataset as for the descriptive statistics. The added variables M2 and M3 are defined FM times PCON and BO times PCON respectively. The residual return contribution measures use no risk adjustment for the calculation of normal returns.													
	$PREMIUM_0$	$RRC_{nav,0}$	$RRC_{adm,1}$	$RRC_{tax,1}$	$RRC_{nav,1}$	$RRC_{nav,2}$	$RRC_{nav,hist}$	*D/NAV*	*PUS*	*PCON*	*FM*	*BO*	*M2*
$PREMIUM_0$	1.0000												
RRC_{nav0t}	0.0732***	1.0000											
$RRC_{adm,1}$	0.1680***	0.0042	1.0000										
$RRC_{tax,1}$	0.0896***	0.0123	0.1016***	1.0000									
$RRC_{nav,1}$	0.0071	-0.0010	0.1460***	0.0356*	1.0000								
$RRC_{nav,2}$	-0.0279	-0.0929***	0.0594***	0.0320	0.0010	1.0000							
$RRC_{nav,hist}$	0.2299***	0.5382***	-0.0341	-0.0387	-0.0539***	-0.1218***	1.0000						
D/NAV	0.0856***	-0.0133	0.0128	0.1623***	-0.0014	-0.0103	-0.0588***	1.0000					
PUS	-0.0689***	0.0140	0.3472***	0.0553***	0.0122	0.0152	0.0056	-0.0142	1.0000				
PCON	-0.0283	0.0261	0.2749***	-0.0223	0.0276	0.0361	0.0085	-0.0365	0.4806***	1.0000			
FM	-0.0057	0.0389	0.0494	-0.0218	0.0032	0.0278	0.0272	0.0437	-0.0253	0.0594	1.0000		
BO	-0.2139***	0.0594	0.0901*	0.1248**	0.0324	0.0321	-0.0049	0.0409	0.1447***	0.2908***	0.3678***	1.0000	
M2	-0.0899*	0.1084**	0.2720***	0.2664***	0.0452	0.0609	0.0710	0.1873***	0.2956***	0.7117***	0.6333***	0.5141***	1.0000
M3	-0.1825***	0.1074**	0.2451***	0.3012***	0.0694	0.0718	0.0325	0.1831***	0.2968***	0.7747***	0.2236***	0.6791***	0.7992***

* statistically significant correlation at the 10 % level, ** at the 5 % level and *** at the 1 % level

Appendix 6.6 Regression results using ordinary least squares and market risk adjustment on residual return contributions

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel A: Firm-year observations December 1972 - December 2004, no controls				
Residual return contribution: net asset value in period t+1, $\left(RRC^{eat}_{nav,t+1}\right)$	0.082	-0.022	0.056	0.059
	(1.548)	(-2.045)**	(1.113)	(1.214)
Residual return contribution: net asset value historic average, linear, $\left(RRC^{eat}_{nav,hist}\right)$	0.257	0.279	0.240	-0.281
	(1.529)	(11.227)***	(1.399)	(-2.316)**
Residual return contribution: net asset value historic average, cubic, $\left(RRC^{eat}_{nav,hist}\right)^3$	-4.250	-0.244	-4.536	4.826
	(-1.720)*	(-5.839)***	(-1.805)*	(2.804)***
Residual return contribution: administrative expenses, $\left(RRC_{adm,t}\right)$	3.522	2.100	3.164	5.256
	(0.999)	(7.142)***	(0.753)	(2.218)**
Residual return contribution: taxes, $\left(RRC_{tax,t}\right)$	2.250	0.073	0.096	0.691
	(2.074)**	(0.370)	(0.062)	(0.841)
Constant	-0.244	-0.161	-0.250	-0.242
	(-13.930)***	(-40.646)***	(-16.208)***	(-19.567)***
Adj R^2	**0.068**	**0.093**	**0.115**	**0.064**
F-statistic	**5.167**	**46.050**	**6.591**	**2.861**
No obs	**286**	**2203**	**217**	**136**

Table A6.6.1: Regression analysis of premiums on excess returns on net asset value. Regressions according to equation 6.1. T-statistics are reported within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

Panel B: Firm-year observations December 1972 - December 2004, with controls			
Residual return contribution: net asset value in period t+1, $\left(RRC^{eat}_{nav,t+1}\right)$	0.128	0.049	0.026
	(2.435)**	(1.117)	(0.554)
Residual return contribution: net asset value historic average, linear, $\left(RRC^{eat}_{nav,hist}\right)$	0.610	0.492	0.117
	(3.390)***	(2.804)***	(0.949)
Residual return contribution: net asset value historic average, cubic, $\left(RRC^{eat}_{nav,hist}\right)^3$	-5.174	-4.534	1.297
	(-2.081)**	(-1.904)*	(0.859)
Residual return contribution: administrative expenses, $\left(RRC_{adm,t}\right)$	9.469	16.832	10.032
	(3.269)***	(2.639)***	(4.840)***
Residual return contribution: taxes, $\left(RRC_{tax,t}\right)$	0.533	-1.317	-2.061
	(0.386)	(-0.834)	(-1.961)*
Portfolio concentration (PCON)	0.209	0.471	0.291
	(2.359)**	(4.736)***	(2.882)***
Portfolio concentration (PCON) * year dummy	-0.238	-0.222	-0.226
	(-3.647)***	(-3.781)***	(-3.301)***
Votes-to-capital * portfolio concentration (M_1)	-0.124	-0.343	-0.119
	(-2.491)**	(-4.404)***	(-1.276)
Constant	-0.255	-0.284	-0.296
	(-7.801)***	(-10.161)***	(-14.146)***
Adj R^2	**0.239**	**0.362**	**0.387**
F-statistic	**7.352**	**11.198**	**7.941**
No obs	**163**	**146**	**89**

Table A6.6.1 cont. Regressions according to equation 6.2. T-statistics are reported within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

Panel C: Firm-year observations July 1981 - December 2004, no controls				
Residual return contribution: net asset value in period t+1, $\left(RRC^{eat}_{nav,t+1}\right)$	0.120	-0.032	0.068	0.068
	(2.120)**	(-3.295)***	(1.337)	(1.426)
Residual return contribution: net asset value historic average, linear, $\left(RRC^{eat}_{nav,hist}\right)$	0.670	0.232	0.470	0.022
	(3.844)***	(9.183)***	(2.688)***	(0.171)
Residual return contribution: net asset value historic average, cubic, $\left(RRC^{eat}_{nav,hist}\right)^3$	-6.197	-0.209	-5.602	2.138
	(-2.764)***	(-5.665)***	(-2.330)**	(1.272)
Residual return contribution: administrative expenses, $\left(RRC_{adm,t}\right)$	3.364	1.571	3.380	8.059
	(0.884)	(5.298)***	(0.749)	(3.494)***
Residual return contribution: taxes, $\left(RRC_{tax,t}\right)$	2.338	-0.734	0.294	0.570
	(2.006)**	(-1.682)*	(0.165)	(0.729)
Constant	-0.196	-0.139	-0.228	-0.231
	(-9.955)***	(-33.186)***	(-14.530)***	(-18.483)***
Adj R^2	**0.138**	**0.070**	**0.170**	**0.109**
F-statistic	**7.739**	**30.711**	**8.046**	**3.452**
No obs	**212**	**1964**	**173**	**101**

Table A6.6.1 cont. Regressions according to equation 6.1. T-statistics are reported within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

Panel D: Firm-year observations July 1981 - December 2004, with controls				
Residual return contribution: net asset value in period t+1, $\left(RRC^{eat}_{nav,t+1}\right)$	0.143	-0.052	0.064	0.014
	(2.748)***	(-2.714)***	(1.492)	(0.305)
Residual return contribution: net asset value historic average, linear, $\left(RRC^{eat}_{nav,hist}\right)$	0.636	0.219	0.522	0.143
	(3.558)***	(5.322)***	(2.994)***	(1.154)
Residual return contribution: net asset value historic average, cubic, $\left(RRC^{eat}_{nav,hist}\right)^3$	-5.325	-0.176	-4.745	1.094
	(-2.173)**	(-4.383)***	(-2.014)**	(0.723)
Residual return contribution: administrative expenses, $\left(RRC_{adm,t}\right)$	9.300	0.965	15.759	9.931
	(3.180)***	(0.951)	(2.479)**	(4.799)***
Residual return contribution: taxes, $\left(RRC_{tax,t}\right)$	0.495	2.554	-1.477	-2.058
	(0.354)	(2.840)***	(-0.956)	(-1.963)*
Portfolio concentration (PCON)	0.218	0.083	0.465	0.282
	(2.476)**	(1.034)	(4.638)***	(2.779)***
Votes-to-capital * portfolio concentration (M_1)	-0.122		-0.326	-0.097
	(-2.586)**		(-4.179)***	(-1.026)
Beneficial owner percentage * portfolio concentration (M_3)		-0.818		
		(-3.114)***		
Constant	-0.260	-0.138	-0.288	-0.303
	(-7.735)***	(-14.586)***	(-10.243)***	(-13.885)***
Adj R^2	**0.255**	**0.132**	**0.379**	**0.383**
F-statistic	**8.487**	**8.920**	**12.870**	**8.100**
No obs	**154**	**365**	**137**	**81**

Table A6.6.1 cont. Regressions according to equation 6.2. T-statistics are reported within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	Sweden sphere companies	Sweden pure companies
Panel A: Firm-year observations December 1972 - December 2004, no controls			
Residual return contribution: unquoted securities in period t+1, $(RRC_{nus,t+1})$	0.164	0.101	0.010
	(2.165)**	(1.184)	(0.093)
Residual return contribution: unquoted securities historic average, linear, $(RRC_{nus,hist})$	0.245	0.132	-0.130
	(1.091)	(0.534)	(-0.478)
Residual return contribution: unquoted securities historic average, cubic, $(RRC_{nus,hist})^3$	-6.193	-6.763	-3.752
	(-1.934)*	(-2.178)**	(-0.501)
Residual return contribution: quoted securities historic average, linear, $(RRC_{nqs,hist})$	0.160	0.183	0.054
	(0.972)	(1.782)	(0.505)
Residual return contribution: administrative expenses, $(RRC_{adm,t})$	3.212	2.918	3.863
	(0.954)	(0.756)	(1.516)
Residual return contribution: taxes, $(RRC_{tax,t})$	2.077	-0.130	0.847
	(1.822)*	(-0.082)	(0.993)
Constant	-0.243	-0.252	-0.240
	(-14.663)***	(-16.986)***	(-18.468)***
Adj R^2	**0.094**	**0.173**	**0.010**
F-statistic	**5.919**	**8.514**	**1.240**
No obs	**286**	**217**	**136**

Table A6.6.2: Regression analysis of premiums on excess returns on quoted and unquoted securities on Swedish data. Regressions according to equation 6.3. T-statistics are reported within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

Panel B: Firm-year observations December 1972 - December 2004, with controls			
Residual return contribution: unquoted securities in period t+1, $\left(RRC_{nus,t+1}\right)$	0.245	0.138	-0.022
	(2.831)***	(1.669)*	(-0.221)
Residual return contribution: unquoted securities historic average, linear, $\left(RRC_{nus,hist}\right)$	0.777	0.543	0.306
	(3.458)***	(2.203)**	-1.174
Residual return contribution: unquoted securities historic average, cubic, $\left(RRC_{nus,hist}\right)^3$	-8.561	-7.245	-8.484
	(-2.974)***	(-2.473)**	(-1.283)
Residual return contribution: quoted securities historic average, linear, $\left(RRC_{nqs,hist}\right)$	0.205	0.232	0.227
	(2.062)**	(2.581)**	(2.296)**
Residual return contribution: administrative expenses, $\left(RRC_{adm,t}\right)$	8.803	15.478	9.617
	(3.170)***	(2.533)**	(4.527)***
Residual return contribution: taxes, $\left(RRC_{tax,t}\right)$	0.602	-1.375	-1.745
	(0.431)	(-0.850)	(-1.642)
Portfolio concentration (PCON)	0.241	0.473	0.326
	(2.859)***	(4.884)***	(3.234)***
Portfolio concentration (PCON) * year dummy	-0.236	-0.210	-0.237
	(-3.436)***	(-3.464)***	(-3.497)***
Votes-to-capital * portfolio concentration (M_1)	-0.127	-0.324	-0.157
	(-2.688)***	(-4.284)***	(-1.675)*
Constant	-0.267	-0.294	-0.294
	(-8.527)***	(-11.101)***	(-13.995)***
Adj R^2	**0.309**	**0.424**	**0.386**
F-statistic	**9.071**	**12.860**	**7.134**
No obs	**163**	**146**	**89**

Table A6.6.2 cont. Regressions according to equation 6.4. T-statistics are reported within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

Panel C: Firm-year observations July 1981 - December 2004, no controls			
Residual return contribution: unquoted securities in period t+1, $\left(RRC_{nus,t+1}\right)$	0.182	0.122	-0.041
	(2.202)**	(1.395)	(-0.395)
Residual return contribution: unquoted securities historic average, linear, $\left(RRC_{nus,hist}\right)$	0.643	0.380	0.331
	(2.756)***	(1.442)	(1.194)
Residual return contribution: unquoted securities historic average, cubic, $\left(RRC_{nus,hist}\right)^3$	-8.445	-8.004	-11.059
	(-2.824)***	(-2.636)***	(-1.549)
Residual return contribution: quoted securities historic average, linear, $\left(RRC_{nqs,hist}\right)$	0.398	0.261	0.187
	(2.335)**	(2.662)***	(1.794)*
Residual return contribution: administrative expenses, $\left(RRC_{adm,t}\right)$	2.777	3.228	7.076
	(0.764)	(0.763)	(2.932)***
Residual return contribution: taxes, $\left(RRC_{tax,t}\right)$	2.090	-0.092	0.626
	(1.674)*	(-0.051)	(0.782)
Constant	-0.196	-0.232	-0.230
	(-10.669)***	(-15.602)***	(-17.885)***
Adj R^2	**0.158**	**0.222**	**0.097**
F-statistic	**7.612**	**9.173**	**2.786**
No obs	**212**	**173**	**101**

Table A6.6.2 cont. Regressions according to equation 6.3. T-statistics are reported within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

Panel D: Firm-year observations July 1981 - December 2004, with controls			
Residual return contribution: unquoted securities in period t+1, $(RRC_{nus,t+1})$	0.287	0.185	-0.046
	(3.656)***	(2.451)**	(-0.467)
Residual return contribution: unquoted securities historic average, linear, $(RRC_{nus,hist})$	0.822	0.618	0.378
	(3.683)***	(2.544)**	(1.408)
Residual return contribution: unquoted securities historic average, cubic, $(RRC_{nus,hist})^3$	-8.855	-7.779	-9.670
	(-3.173)***	(-2.768)***	(-1.450)
Residual return contribution: quoted securities historic average, linear, $(RRC_{nqs,hist})$	0.206	0.217	0.234
	(2.053)**	(2.394)**	(2.345)**
Residual return contribution: administrative expenses, $(RRC_{adm,t})$	8.614	13.976	9.619
	(3.035)***	(2.296)**	(4.538)***
Residual return contribution: taxes, $(RRC_{tax,t})$	0.576	-1.600	-1.740
	(0.405)	(-1.007)	(-1.648)
Portfolio concentration (PCON)	0.257	0.470	0.318
	(3.146)***	(4.794)***	(3.149)***
Votes-to-capital * portfolio concentration (M_1)	-0.125	-0.302	-0.139
	(-2.853)***	(-3.995)***	(-1.454)
Constant	-0.276	-0.301	-0.300
	(-8.780)***	(-11.641)***	(-13.845)***
Adj R^2	**0.342**	**0.456**	**0.386**
F-statistic	**10.926**	**15.255**	**7.299**
No obs	**154**	**137**	**81**

Table A6.6.2 cont. Regressions according to equation 6.4. T-statistics are reported within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

Appendix 6.7 Regression results using ordinary least squares and beta adjusted residual return contributions

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel A: Firm-year observations December 1972 - December 2004, no controls				
Residual return contribution: net asset value in period 1, $\left(RRC^{eat}_{nav,1}\right)$	0.155	-0.026	0.150	0.141
	(3.263)***	(2.469)**	(2.673)***	(2.008)**
Residual return contribution: net asset value historic average, linear, $\left(RRC^{eat}_{nav,hist}\right)$	0.250	0.279	0.057	-0.119
	(1.429)	(12.022)***	(0.356)	(-1.104)
Residual return contribution: net asset value historic average, cubic, $\left(RRC^{eat}_{nav,hist}\right)^3$	-2.280	-0.230	-2.108	1.160
	(-1.142)	(-6.204)***	(-1.042)	(2.167)**
Residual return contribution: administrative expenses in period 1, $\left(RRC_{adm,1}\right)$	4.022	1.974	4.843	5.517
	(1.273)	(6.835)***	(1.051)	(2.202)**
Residual return contribution: taxes in period 1, $\left(RRC_{tax,1}\right)$	1.923	-0.195	0.325	0.598
	(1.943)*	(-0.545)	(0.211)	(0.466)
Constant	-0.240	-0.167	-0.247	-0.245
	(-14.729)***	(-43.812)***	(-15.000)***	(-20.390)***
Adj R^2	**0.068**	**0.100**	**0.090**	**0.087**
F-statistic	**5.188**	**49.750**	**5.262**	**3.588**
No obs	**286**	**2203**	**217**	**136**

Table A6.7.1: Regression analysis of premiums on excess returns on net asset value. Regressions according to equation 6.1. T-statistics are reported within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel B: Firm-year observations December 1972 - December 2004, with controls				
Residual return contribution: net asset value in period 1, $\left(RRC_{nav,1}^{eat}\right)$	0.151		0.103	0.060
	(3.002)***		(2.105)**	(1.079)
Residual return contribution: net asset value historic average, linear, $\left(RRC_{nav,hist}^{eat}\right)$	0.489		0.300	0.193
	(2.904)***		(2.064)**	(1.754)*
Residual return contribution: net asset value historic average, cubic, $\left(RRC_{nav,hist}^{eat}\right)^3$	-3.722		-2.986	-0.407
	(-1.980)**		(-1.806)*	(-0.823)
Residual return contribution: administrative expenses in period 1, $\left(RRC_{adm,1}\right)$	7.480		16.838	9.080
	(2.698)***		(2.847)***	(6.334)***
Residual return contribution: taxes in period 1, $\left(RRC_{tax,1}\right)$	-0.073		-1.683	-2.356
	(-0.051)		(-1.263)	(-1.747)*
Portfolio concentration (PCON)	0.180		0.476	0.230
	(1.948)*		(4.532)***	(2.218)**
Portfolio concentration (PCON) * year dummy	-0.236		-0.210	-0.232
	(-3.518)***		(-3.621)***	(-4.353)***
Votes-to-capital * portfolio concentration (M_1)	-0.117		-0.348	-0.088
	(-2.508)**		(-4.507)***	(-0.980)
Constant	-0.236		-0.279	-0.283
	(-6.948)***		(-9.602)***	(-13.356)***
Adj R^2	**0.237**		**0.357**	**0.394**
F-statistic	**7.304**		**11.049**	**8.156**
No obs	**163**		**146**	**89**

Table A6.7.1 cont. Regressions according to equation 6.2. T-statistics are reported within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel C: Firm-year observations July 1981 - December 2004, no controls				
Residual return contribution: net asset value in period 1, $\left(RRC^{eat}_{nav,1}\right)$	0.172	-0.039	0.147	0.131
	(3.381)***	(-4.007)***	(2.525)**	(1.978)*
Residual return contribution: net asset value historic average, linear, $\left(RRC^{eat}_{nav,hist}\right)$	0.623	0.226	0.255	0.108
	(3.174)***	(9.594)***	(1.508)	(1.018)
Residual return contribution: net asset value historic average, cubic, $\left(RRC^{eat}_{nav,hist}\right)^3$	-4.248	-0.189	-3.015	0.073
	(-2.176)**	(-5.973)***	(-1.481)	(0.128)
Residual return contribution: administrative expenses in period 1, $\left(RRC_{adm,1}\right)$	2.790	1.493	5.494	7.520
	(0.892)	(5.083)***	(1.115)	(6.364)***
Residual return contribution: taxes in period 1, $\left(RRC_{tax,1}\right)$	1.499	-0.994	0.258	0.138
	(1.438)	(-2.333)**	(0.144)	(0.089)
Constant	-0.191	-0.144	-0.229	-0.229
	(-10.075)***	(-35.182)***	(-13.098)***	(-19.798)***
Adj R^2	**0.158**	**0.075**	**0.125**	**0.182**
F-statistic	**8.891**	**31.791**	**5.927**	**5.435**
No obs	**212**	**1964**	**173**	**101**

Table A6.7.1 cont. Regressions according to equation 6.1. T-statistics are reported within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel D: Firm-year observations July 1981 - December 2004, with controls				
Residual return contribution: net asset value in period 1, $\left(RRC^{eat}_{nav,1}\right)$	0.158	-0.057	0.111	0.048
	(3.081)***	(-2.822)***	(2.246)**	(0.822)
Residual return contribution: net asset value historic average, linear, $\left(RRC^{eat}_{nav,hist}\right)$	0.508	0.192	0.320	0.213
	(3.002)***	(4.749)***	(2.184)**	(1.914)*
Residual return contribution: net asset value historic average, cubic, $\left(RRC^{eat}_{nav,hist}\right)^3$	-3.836	-0.149	-3.116	-0.467
	(-2.041)**	(-4.085)***	(-1.871)*	(-0.919)
Residual return contribution: administrative expenses in period 1, $\left(RRC_{adm,1}\right)$	7.161	0.772	15.902	8.021
	(2.622)***	(0.754)	(2.689)***	(6.570)***
Residual return contribution: taxes in period 1, $\left(RRC_{tax,1}\right)$	-0.151	2.457	-1.881	-2.366
	(-0.104)	(2.783)***	(-1.444)	(-1.692)*
Portfolio concentration (PCON)	0.185	0.078	0.470	0.228
	(1.991)**	(0.978)	(4.447)***	(2.173)**
Votes-to-capital * portfolio concentration (M_1)	-0.115		-0.336	-0.075
	(-2.583)**		(-4.310)***	(-0.806)
Beneficial owner percentage * portfolio concentration (M_3)		-0.808		
		(-3.172)***		
Constant	-0.239	-0.138	-0.280	-0.288
	(-6.736)***	(-15.214)***	(-9.413)***	(-12.972)***
Adj R^2	**0.248**	**0.117**	**0.369**	**0.387**
F-statistic	**8.223**	**7.871**	**12.344**	**8.232**
No obs	**154**	**365**	**137**	**81**

Table A6.7.1 cont. Regressions according to equation 6.2. T-statistics are reported within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	Sweden sphere companies	Sweden pure companies
Panel A: Firm-year observations December 1972 - December 2004, no controls			
Residual return contribution: unquoted securities in period 1, $(\mathrm{RRC}_{\mathrm{nus},1})$	0.176	0.132	0.012
	(1.935)*	(1.564)	(0.107)
Residual return contribution: unquoted securities historic average, linear, $(\mathrm{RRC}_{\mathrm{nus,hist}})$	0.303	0.134	0.083
	(1.211)	(0.568)	(0.281)
Residual return contribution: unquoted securities historic average, cubic, $(\mathrm{RRC}_{\mathrm{nus,hist}})^3$	-8.246	-9.651	-7.881
	(-2.666)***	(-5.425)***	(-1.361)
Residual return contribution: quoted securities historic average, linear, $(\mathrm{RRC}_{\mathrm{nqs,hist}})$	0.301	0.144	0.119
	(1.699)	(1.499)	(1.136)
Residual return contribution: administrative expenses in period 1, $(\mathrm{RRC}_{\mathrm{adm},1})$	3.230	1.485	4.027
	(1.103)	(0.438)	(1.261)
Residual return contribution: taxes in period 1, $(\mathrm{RRC}_{\mathrm{tax},1})$	2.266	0.191	0.886
	(1.988)**	(0.123)	(0.626)
Constant	-0.247	-0.248	-0.241
	(-16.538)***	(-17.471)***	(-18.782)***
Adj R^2	**0.126**	**0.241**	**0.016**
F-statistic	**7.870**	**12.436**	**1.371**
No obs	**286**	**217**	**136**

Table A6.7.2: Regression analysis of premiums on excess returns on quoted and unquoted securities on Swedish data. Regressions according to equation 6.3. T-statistics are reported within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	Sweden sphere companies	Sweden pure companies
Panel B: Firm-year observations December 1972 - December 2004, with controls			
Residual return contribution: unquoted securities in period 1, $(RRC_{nus,1})$	0.269	0.184	-0.060
	(3.762)***	(2.501)**	(-0.645)
Residual return contribution: unquoted securities historic average, linear, $(RRC_{nus,hist})$	0.900	0.507	0.460
	(4.166)***	(2.293)**	(1.503)
Residual return contribution: unquoted securities historic average, cubic, $(RRC_{nus,hist})^3$	-11.853	-10.146	-12.559
	(-6.696)***	(-6.255)***	(-2.191)**
Residual return contribution: quoted securities historic average, linear, $(RRC_{nqs,hist})$	0.028	0.021	0.167
	(0.314)	(0.268)	(1.911)*
Residual return contribution: administrative expenses in period 1, $(RRC_{adm,1})$	6.507	9.706	9.036
	(2.389)**	(1.892)	(6.374)***
Residual return contribution: taxes in period 1, $(RRC_{tax,1})$	0.694	-1.017	-2.023
	(0.502)	(-0.735)	(-1.320)
Portfolio concentration (PCON)	0.158	0.366	0.290
	(2.067)**	(4.349)***	(2.151)**
Portfolio concentration (PCON) * year dummy	-0.230	-0.186	-0.237
	(-3.465)***	(-3.156)***	(-4.399)***
Votes-to-capital * portfolio concentration (M_1)	-0.098	-0.248	-0.141
	(-2.524)**	(-3.857)***	(-1.245)
Constant	-0.242	-0.275	-0.286
	(-7.906)***	(-10.893)***	(-12.519)***
Adj R^2	**0.392**	**0.500**	**0.390**
F-statistic	**12.605**	**17.094**	**7.261**
No obs	**163**	**146**	**89**

Table A6.7.2 cont. Regressions according to equation 6.4. T-statistics are reported within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	Sweden sphere companies	Sweden pure companies
Panel C: Firm-year observations July 1981 - December 2004, no controls			
Residual return contribution: unquoted securities in period 1, $(RRC_{nus,1})$	0.174	0.148	-0.092
	(1.712)*	(1.693)*	(-0.942)
Residual return contribution: unquoted securities historic average, linear, $(RRC_{nus,hist})$	0.688	0.366	0.605
	(2.630)***	(1.438)	(2.337)**
Residual return contribution: unquoted securities historic average, cubic, $(RRC_{nus,hist})^3$	-10.792	-10.779	-17.877
	(-4.164)***	(-6.338)***	(-3.694)**
Residual return contribution: quoted securities historic average, linear, $(RRC_{nqs,hist})$	0.404	0.159	0.190
	(2.157)**	(1.642)	(2.061)**
Residual return contribution: administrative expenses in period 1, $(RRC_{adm,1})$	2.334	1.772	7.111
	(0.771)	(0.497)	(4.470)***
Residual return contribution: taxes in period 1, $(RRC_{tax,1})$	2.104	0.156	0.412
	(1.733)	(0.090)	(0.258)
Constant	-0.202	-0.231	-0.230
	(-12.668)***	(-16.904)***	(-21.726)***
Adj R^2	**0.202**	**0.294**	**0.147**
F-statistic	**9.924**	**12.926**	**3.869**
No obs	**212**	**173**	**101**

Table A6.7.2 cont. Regressions according to equation 6.3. T-statistics are reported within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	Sweden sphere companies	Sweden pure companies
Panel D: Firm-year observations July 1981 - December 2004, with controls			
Residual return contribution: unquoted securities in period 1, $(RRC_{nus,1})$	0.295	0.218	-0.088
	(4.317)***	(3.174)***	(-0.985)
Residual return contribution: unquoted securities historic average, linear, $(RRC_{nus,hist})$	0.944	0.579	0.558
	(4.359)***	(2.642)***	(1.696)*
Residual return contribution: unquoted securities historic average, cubic, $(RRC_{nus,hist})^3$	-12.155	-10.705	-14.312
	(-7.196)***	(-7.411)***	(-2.362)**
Residual return contribution: quoted securities historic average, linear, $(RRC_{nqs,hist})$	0.018	-0.000	0.166
	(0.203)	(-0.005)	(1.858)*
Residual return contribution: administrative expenses in period 1, $(RRC_{adm,1})$	6.207	8.125	9.112
	(2.187)**	(1.649)	(6.743)***
Residual return contribution: taxes in period 1, $(RRC_{tax,1})$	0.648	-1.210	-2.044
	(0.459)	(-0.908)	(-1.327)
Portfolio concentration (PCON)	0.169	0.361	0.286
	(2.252)**	(4.264)***	(2.088)**
Votes-to-capital * portfolio concentration (M_1)	-0.098	-0.228	-0.129
	(-2.708)***	(-3.632)***	(-1.094)
Constant	-0.246	-0.280	-0.291
	(-7.908)***	(-11.356)***	(-12.457)***
Adj R^2	**0.420**	**0.533**	**0.395**
F-statistic	**14.854**	**20.397**	**7.522**
No obs	**154**	**137**	**81**

Table A6.7.2 cont. Regressions according to equation 6.4. T-statistics are reported within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

Appendix 6.8 Regression results using ordinary least squares fixed effects

Tables A6.8.1 and A6.8.2 include estimates when residual returns are measured using market risk adjustments.

Tables A6.8.3 and A6.8.4 include estimates when residual returns are measured using beta risk adjustments.

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel A: Firm-year observations December 1972 - December 2004, no controls				
Residual return contribution: net asset value in period 1, $\left(RRC^{eat}_{nav,1}\right)$	0.015	-0.019	0.053	0.064
	(0.306)	(-2.023)**	(1.152)	(1.395)
Residual return contribution: net asset value historic average, linear, $\left(RRC^{eat}_{nav,hist}\right)$	0.057	0.222	0.125	-0.262
	(0.385)	(9.861)***	(0.856)	(-2.276)**
Residual return contribution: net asset value historic average, cubic, $\left(RRC^{eat}_{nav,hist}\right)^3$	-3.802	-0.107	-3.892	4.418
	(-1.717)*	(-2.903)***	(-1.712)*	(2.736)***
Residual return contribution: administrative expenses in period 1 , $\left(RRC_{adm,1}\right)$	8.916	1.606	14.404	7.715
	(3.453)***	(3.108)***	(3.261)***	(2.976)***
Residual return contribution: taxes in period 1, $\left(RRC_{tax,1}\right)$	2.816	-0.379	1.092	1.374
	(3.018)***	(-1.054)	(0.818)	(1.672)*
Adj R^2	**0.297**	**0.303**	**0.312**	**0.225**
F-statistic	**37.309**	**288.994**	**28.797**	**13.302**
No obs	**286**	**2203**	**217**	**136**

Table A6.8.1: **Regression analysis of premiums on excess returns on net asset value.** Regression model according to equation 6.1. T-statistics are presented within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel B: Firm-year observations December 1972 - December 2004, with controls				
Residual return contribution: net asset value in period 1, $\left(RRC^{eat}_{nav,1}\right)$	0.130		0.121	0.028
	(3.095)***		(2.750)***	(0.596)
Residual return contribution: net asset value historic average, linear, $\left(RRC^{eat}_{nav,hist}\right)$	0.438		0.478	0.160
	(2.790)***		(3.064)***	(1.168)
Residual return contribution: net asset value historic average, cubic, $\left(RRC^{eat}_{nav,hist}\right)^3$	-2.292		-2.463	1.121
	(-1.095)		(-1.225)	(0.720)
Residual return contribution: administrative expenses in period 1, $\left(RRC_{adm,1}\right)$	7.256		9.000	16.033
	(1.430)		(1.423)	(2.794)***
Residual return contribution: taxes in period 1, $\left(RRC_{tax,t}\right)$	0.605		-2.640	-2.448
	(0.370)		(-1.742)*	(-2.012)**
Portfolio concentration (PCON)	0.316		0.290	0.378
	(4.270)***		(2.231)**	(2.739)***
Portfolio concentration (PCON) * Dum	-0.257		-0.275	-0.263
	(-4.016)***		(-4.462)***	(-3.507)***
Votes-to-capital * portfolio concentration (M_1)	-0.170		-0.162	-0.232
	(-6.538)***		(-1.742)*	(-1.983)*
Adj R^2	**0.556**		**0.499**	**0.419**
F-statistic	**32.706**		**23.462**	**11.497**
No obs	**163**		**146**	**89**

Table A6.8.1 cont. Regression model according to equation 6.3. T-statistics are presented within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel C: Firm-year observations July 1981 - December 2004, no controls				
Residual return contribution: net asset value in period 1, $(RRC^{eat}_{nav,1})$	0.107	-0.036	0.111	0.068
	(2.378)**	(-3.818)***	(2.312)**	(1.478)
Residual return contribution: net asset value historic average, linear, $(RRC^{eat}_{nav,hist})$	0.369	0.159	0.392	-0.005
	(2.493)**	(7.053)***	(2.669)***	(-0.037)
Residual return contribution: net asset value historic average, cubic, $(RRC^{eat}_{nav,hist})^3$	-3.544	-0.052	-3.601	2.184
	(-2.064)**	(-1.466)	(-2.017)**	(1.335)
Residual return contribution: administrative expenses in period 1, $(RRC_{adm,1})$	8.497	1.777	8.864	8.964
	(3.373)***	(3.194)***	(2.016)**	(3.165)***
Residual return contribution: taxes in period 1, $(RRC_{tax,t})$	2.393	-2.665	-0.067	1.172
	(2.770)***	(-5.565)***	(-0.041)	(1.314)
Adj R^2	**0.581**	**0.326**	**0.435**	**0.250**
F-statistic	**79.972**	**287.452**	**37.349**	**11.843**
No obs	**212**	**1964**	**173**	**101**

Table A6.8.1 cont. Regression model according to equation 6.1. T-statistics are presented within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel D: Firm-year observations July 1981 - December 2004, with controls				
Residual return contribution: net asset value in period 1, $\left(RRC^{eat}_{nav,1}\right)$	0.144	-0.027	0.138	0.022
	(3.349)***	(-1.503)	(3.136)***	(0.458)
Residual return contribution: net asset value historic average, linear, $\left(RRC^{eat}_{nav,hist}\right)$	0.483	0.237	0.529	0.207
	(3.116)***	(6.538)***	(3.458)***	(1.478)
Residual return contribution: net asset value historic average, cubic, $\left(RRC^{eat}_{nav,hist}\right)^3$	-2.477	-0.128	-2.677	0.760
	(-1.212)	(-3.386)***	(-1.378)	(0.481)
Residual return contribution: administrative expenses in period 1, $\left(RRC_{adm,1}\right)$	6.259	0.305	7.535	16.902
	(1.240)	(0.221)	(1.190)	(2.831)***
Residual return contribution: taxes in period 1, $\left(RRC_{tax,t}\right)$	0.460	4.766	-3.141	-2.398
	(0.271)	(2.360)**	(-2.033)**	(-1.946)*
Portfolio concentration (PCON)	0.343	0.180	0.305	0.341
	(4.573)***	(2.070)**	(2.328)**	(2.352)**
Votes-to-capital * portfolio concentration (M_1)	-0.173		-0.153	-0.196
	(-6.407)***		(-1.628)	(-1.543)
Beneficial owner percentage * portfolio concentration (M_3)		-1.881		
		(-2.644)***		
Adj R^2	**0.565**	**0.653**	**0.514**	**0.405**
F-statistic	**37.301**	**130.352**	**27.189**	**11.728**
No obs	**154**	**365**	**137**	**81**

Table A6.8.1 cont. Regression model according to equation 6.3. T-statistics are presented within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	Sweden sphere companies	Sweden pure companies
Panel A: Firm-year observations December 1972 - December 2004, no controls			
Residual return contribution: unquoted securities in period 1, $\left(RRC_{nus,t+1}\right)$	0.065	0.096	-0.065
	(0.908)	(1.280)	(-0.616)
Residual return contribution: unquoted securities historic average, linear, $\left(RRC_{nus,hist}\right)$	-0.032	-0.034	-0.380
	(0.147)	(-0.170)	(-1.392)**
Residual return contribution: unquoted securities historic average, cubic, $\left(RRC_{nus,hist}\right)^3$	-5.385	-5.893	-0.898
	(-1.852)*	(-2.154)***	(-0.126)
Residual return contribution: quoted securities historic average, linear, $\left(RRC_{nqs,hist}\right)$	0.116	0.158	0.092
	(0.893)	(1.711)*	(0.910)**
Residual return contribution: administrative expenses in period 1, $\left(\mathrm{RRC}_{\mathrm{adm,1}}\right)$	8.427	13.607	5.642
	(3.341)***	(3.263)***	(2.071)**
Residual return contribution: taxes in period 1, $\left(\mathrm{RRC}_{\mathrm{tax.t}}\right)$	2.544	0.664	1.352
	(2.548)**	(0.462)	(1.606)
Adj R^2	**0.317**	**0.374**	**0.196**
F-statistic	**32.453**	**29.450**	**9.566**
No obs	**286**	**217**	**136**

Table A6.8.2: Regression analysis of premiums on excess returns on quoted and unquoted securities on Swedish data. Regression model according to equation 6.2. T-statistics are presented within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	Sweden sphere companies	Sweden pure companies
Panel B: Firm-year observations December 1972 - December 2004, with controls			
Residual return contribution: unquoted securities in period 1, $(RRC_{nus,t+1})$	0.271	0.249	-0.020
	(4.098)***	(3.151)***	(-0.189)
Residual return contribution: unquoted securities historic average, linear, $(RRC_{nus,hist})$	0.616	0.685	0.259
	(3.207)***	(3.478)***	(0.900)
Residual return contribution: unquoted securities historic average, cubic, $(RRC_{nus,hist})^3$	-4.764	-4.999	-5.924
	(-1.932)*	(-2.167)**	(-0.828)
Residual return contribution: quoted securities historic average, linear, $(RRC_{nqs,hist})$	0.267	0.256	0.257
	(2.959)***	(2.911)***	(2.413)**
Residual return contribution: administrative expenses in period 1, $(RRC_{adm,t})$	6.776	8.047	12.797
	(1.490)	(1.436)	(1.860)*
Residual return contribution: taxes in period 1, $(RRC_{tax,t})$	0.732	-2.448	-2.275
	(0.479)	(-1.554)	(-1.851)*
Portfolio concentration (PCON)	0.417	0.397	0.411
	(5.095)***	(2.983)***	(2.915)***
Portfolio concentration (PCON) * Dum	-0.282	-0.295	-0.270
	(-4.123)***	(-4.338)***	(-3.641)***
Votes-to-capital * portfolio concentration (M_1)	-0.198	-0.196	-0.254
	(-6.587)**	(-2.150)**	(-2.135)**
Adj R^2	**0.616**	**0.560**	**0.411**
F-statistic	**35.880**	**25.671**	**9.916**
No obs	**163**	**146**	**89**

Table A6.8.2 cont. Regression model according to equation 6.4. T-statistics are presented within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	Sweden sphere companies	Sweden pure companies
Panel C: Firm-year observations July 1981 - December 2004, no controls			
Residual return contribution: unquoted securities in period 1, $(RRC_{nus,t+1})$	0.164	0.167	-0.109
	(2.378)**	(2.033)**	(-1.052)
Residual return contribution: unquoted securities historic average, linear, $(RRC_{nus,hist})$	0.382	0.331	0.091
	(1.891)*	(1.750)*	(0.305)
Residual return contribution: unquoted securities historic average, cubic, $(RRC_{nus,hist})^3$	-5.162	-5.711	-8.408
	(-2.254)**	(-2.607)***	(-1.187)
Residual return contribution: quoted securities historic average, linear, $(RRC_{nqs,hist})$	0.178	0.256	0.196
	(1.739)*	(2.811)***	(1.864)*
Residual return contribution: administrative expenses in period 1, $(\mathrm{RRC}_{\mathrm{adm},1})$	7.544	9.014	6.586
	(2.920)***	(2.147)**	(2.213)**
Residual return contribution: taxes in period 1, $(\mathrm{RRC}_{\mathrm{tax},t})$	2.181	-0.414	0.806
	(2.415)**	(-0.253)	(0.870)
Adj R^2	**0.592**	**0.470**	**0.244**
F-statistic	**66.767**	**34.127**	**9.450**
No obs	**212**	**173**	**101**

Table A6.8.2 cont. Regression model according to equation 6.2. T-statistics are presented within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	Sweden sphere companies	Sweden pure companies
Panel D: Firm-year observations July 1981 - December 2004, with controls			
Residual return contribution: unquoted securities in period 1, $(RRC_{nus,t+1})$	0.311	0.302	-0.029
	(5.030)***	(4.092)***	(-0.258)
Residual return contribution: unquoted securities historic average, linear, $(RRC_{nus,hist})$	0.674	0.748	0.359
	(3.523)***	(3.843)***	(1.154)
Residual return contribution: unquoted securities historic average, cubic, $(RRC_{nus,hist})^3$	-4.933	-5.165	-6.929
	(-2.074)**	(-2.382)**	(-0.953)
Residual return contribution: quoted securities historic average, linear, $(RRC_{nqs,hist})$	0.293	0.280	0.262
	(3.371)***	(3.255)***	(2.373)**
Residual return contribution: administrative expenses in period 1, $(RRC_{adm,1})$	5.487	6.287	14.062
	(1.234)	(1.142)	(1.887)*
Residual return contribution: taxes in period 1, $(RRC_{tax,t})$	0.543	-3.062	-2.241
	(0.343)	(-1.905)*	(-1.804)*
Portfolio concentration (PCON)	0.465	0.435	0.383
	(5.859)***	(3.276)***	(2.588)**
Votes-to-capital * portfolio concentration (M_1)	-0.205	-0.192	-0.226
	(-6.780)***	(-2.066)**	(-1.756)*
Adj R^2	**0.637**	**0.591**	**0.397**
F-statistic	**42.130**	**30.956**	**9.966**
No obs	**154**	**137**	**81**

Table A6.8.2 cont. Regression model according to equation 6.4. T-statistics are presented within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel A: Firm-year observations December 1972 - December 2004, no controls				
Residual return contribution: net asset value in period 1, $\left(RRC_{nav,1}^{eat}\right)$	0.078	-0.026	0.123	0.135
	(1.731)*	(-2.662)***	(2.466)**	(2.401)**
Residual return contribution: net asset value historic average, linear, $\left(RRC_{nav,hist}^{eat}\right)$	0.080	0.199	-0.055	-0.130
	(0.588)	(9.056)***	(-0.422)	-(1.188)
Residual return contribution: net asset value historic average, cubic, $\left(RRC_{nav,hist}^{eat}\right)^3$	-2.228	-0.072	-1.950	0.831
	(-1.324)	(-2.109)**	(-1.213)	(1.384)
Residual return contribution: administrative expenses in period 1, $\left(RRC_{adm,1}\right)$	9.817	1.743	16.055	7.587
	(3.811)***	(3.381)***	(3.761)***	(4.017)***
Residual return contribution: taxes in period 1, $\left(RRC_{tax,t}\right)$	2.944	-0.467	1.688	1.222
	(3.285)***	(-1.315)	(1.344)	(1.332)
Adj R^2	**0.276**	**0.299**	**0.315**	**0.230**
F-statistic	**34.405**	**284.611**	**29.082**	**13.556**
No obs	**286**	**2203**	**217**	**136**

Table A6.8.3: Regression analysis of premiums on excess returns on net asset value. Regression model according to equation 6.1. T-statistics are presented within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel B: Firm-year observations December 1972 - December 2004, with controls				
Residual return contribution: net asset value in period 1, $(RRC^{eat}_{nav,1})$	0.135		0.160	0.090
	(3.204)***		(3.528)***	(1.769)*
Residual return contribution: net asset value historic average, linear, $(RRC^{eat}_{nav,hist})$	0.317		0.330	0.243
	(2.540)**		(2.659)***	(2.034)**
Residual return contribution: net asset value historic average, cubic, $(RRC^{eat}_{nav,hist})^3$	-1.615		-1.685	-0.233
	(-1.358)		(-1.471)	(-0.323)
Residual return contribution: administrative expenses in period 1, $(RRC_{adm,1})$	7.566		9.075	15.875
	(1.590)		(1.654)	(3.279)***
Residual return contribution: taxes in period 1, $(RRC_{tax,t})$	0.235		-2.869	-2.900
	(0.140)		(-2.171)**	(-2.487)**
Portfolio concentration (PCON)	0.226		0.167	0.288
	(2.788)***		(1.353)	(1.951)*
Portfolio concentration (PCON) * Dum	-0.223		-0.232	-0.272
	(-3.793)***		(-3.860)***	(-5.087)***
Votes-to-capital * portfolio concentration (M_1)	-0.146		-0.118	-0.175
	(-5.733)***		(-1.442)	(-1.295)
Adj R^2	**0.550**		**0.503**	**0.431**
F-statistic	**32.036**		**23.835**	**11.951**
No obs	**163**		**146**	**89**

Table A6.8.3 cont. Regression model according to equation 6.3. T-statistics are presented within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel C: Firm-year observations July 1981 - December 2004, no controls				
Residual return contribution: net asset value in period 1, $\left(RRC^{eat}_{nav,1}\right)$	0.120	-0.044	0.161	0.144
	(2.658)***	(-4.514)***	(3.192)***	(2.504)**
Residual return contribution: net asset value historic average, linear, $\left(RRC^{eat}_{nav,hist}\right)$	0.296	0.122	0.218	0.129
	(2.170)**	(5.545)***	(1.614)	(1.089)
Residual return contribution: net asset value historic average, cubic, $\left(RRC^{eat}_{nav,hist}\right)^3$	-2.314	-0.004	-1.908	-0.000
	(-1.813)*	(-0.119)	(-1.555)	(-0.000)
Residual return contribution: administrative expenses in period 1, $\left(RRC_{adm,1}\right)$	8.668	1.891	10.414	8.774
	(3.624)***	(3.411)***	(2.571)**	(3.979)***
Residual return contribution: taxes in period 1, $\left(RRC_{tax,t}\right)$	2.176	-2.757	0.237	0.747
	(2.418)**	(-5.784)***	(0.157)	(0.604)
Adj R^2	**0.580**	**0.322**	**0.435**	**0.299**
F-statistic	**79.689**	**282.244**	**37.423**	**14.182**
No obs	**212**	**1964**	**173**	**101**

Table A6.8.3 cont. Regression model according to equation 6.1. T-statistics are presented within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel D: Firm-year observations July 1981 - December 2004, with controls				
Residual return contribution: net asset value in period 1, $\left(RRC^{eat}_{nav,1}\right)$	0.145	-0.036	0.176	0.092
	(3.398)***	(-2.070)**	(3.808)***	(1.738)*
Residual return contribution: net asset value historic average, linear, $\left(RRC^{eat}_{nav,hist}\right)$	0.360	0.196	0.376	0.296
	(2.875)***	(5.225)***	(3.027)***	(2.464)**
Residual return contribution: net asset value historic average, cubic, $\left(RRC^{eat}_{nav,hist}\right)^3$	-1.725	-0.086	-1.789	-0.356
	(-1.447)	(-2.030)**	(-1.560)	(-0.480)
Residual return contribution: administrative expenses in period 1, $\left(RRC_{adm,1}\right)$	6.805	0.662	7.897	17.703
	(1.435)	(0.468)	(1.450)	(3.491)***
Residual return contribution: taxes in period 1, $\left(RRC_{tax,1}\right)$	0.070	4.291	-3.382	-2.884
	(0.040)	(1.847)*	(-2.519)**	(-2.353)**
Portfolio concentration (PCON)	0.241	0.202	0.169	0.229
	(2.843)***	(2.263)**	(1.368)	(1.488)
Votes-to-capital * portfolio concentration (M_1)	-0.146		-0.108	-0.124
	(-5.631)***		(-1.328)	(-0.834)
Beneficial owner percentage * portfolio concentration (M_3)		-1.863		
		(-2.593)***		
Adj R^2	**0.556**	**0.632**	**0.515**	**0.426**
F-statistic	**36.065**	**120.176**	**27.27**	**12.572**
No obs	**154**	**365**	**137**	**81**

Table A6.8.3 cont. Regression model according to equation 6.3. T-statistics are presented within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	Sweden sphere companies	Sweden pure companies
Panel A: Firm-year observations December 1972 - December 2004, no controls			
Residual return contribution: unquoted securities in period 1, $(RRC_{nus,t+1})$	0.056	0.115	-0.024
	(0.704)	(1.617)	(-0.219)
Residual return contribution: unquoted securities historic average, linear, $(RRC_{nus,hist})$	0.059	0.014	-0.140
	(0.256)	(0.071)	(-0.0491)
Residual return contribution: unquoted securities historic average, cubic, $(RRC_{nus,hist})^3$	-8.629	-8.813	-5.662
	(-3.424)***	(-4.455)***	(-1.024)
Residual return contribution: quoted securities historic average, linear, $(RRC_{nqs,hist})$	0.278	0.084	0.031
	(1.881)*	(0.951)	(0.297
Residual return contribution: administrative expenses in period 1, $(RRC_{adm,1})$	7.892	12.226	6.233
	(3.437)***	(3.119)***	(2.843)***
Residual return contribution: taxes in period 1, $(RRC_{tax,1})$	2.772	1.049	1.458
	(2.908)***	(0.765)	(1.433)
Adj R^2	**0.353**	**0.427**	**0.179**
F-statistic	**37.059**	**35.813**	**8.876**
No obs	**286**	**217**	**136**

Table A6.8.4: Regression analysis of premiums on excess returns on quoted and unquoted securities on Swedish data. Regression model according to equation 6.2. T-statistics are presented within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	Sweden sphere companies	Sweden pure companies
Panel B: Firm-year observations December 1972 - December 2004, with controls			
Residual return contribution: unquoted securities in period 1, $(RRC_{nus,t+1})$	0.261	0.272	0.000
	(4.157)***	(3.509)***	(0.004)
Residual return contribution: unquoted securities historic average, linear, $(RRC_{nus,hist})$	0.643	0.664	0.473
	(3.482)***	(3.351)***	(1.701)*
Residual return contribution: unquoted securities historic average, cubic, $(RRC_{nus,hist})^3$	-8.104	-7.991	-8.371
	(-4.974)***	(-5.211)***	(-1.326)
Residual return contribution: quoted securities historic average, linear, $(RRC_{nqs,hist})$	0.128	0.096	0.172
	(1.329)	(0.982)	(1.730)*
Residual return contribution: administrative expenses in period 1, $(RRC_{adm,1})$	5.831	7.452	14.083
	(1.458)	(1.606)	(2.220)**
Residual return contribution: taxes in period 1, $(RRC_{tax,t})$	0.828	-1.845	-2.528
	(0.568)	(-1.340)	(-1.859)*
Portfolio concentration (PCON)	0.343	0.330	0.375
	(4.468)***	(2.619)**	(2.182)**
Portfolio concentration (PCON) * Dum	-0.261	-0.268	-0.275
	(-4.152)***	(-4.270)***	(-5.391)***
Votes-to-capital * portfolio concentration (M_1)	-0.167	-0.170	-0.227
	(-5.986)***	(-2.032)*	(-1.538)
Adj R^2	**0.633**	**0.582**	**0.400**
F-statistic	**38.344**	**27.892**	**9.589**
No obs	**163**	**146**	**89**

Table A6.8.4 cont. Regression model according to equation 6.4. T-statistics are presented within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	Sweden sphere companies	Sweden pure companies
Panel C: Firm-year observations July 1981 - December 2004, no controls			
Residual return contribution: unquoted securities in period 1, $\left(RRC_{nus,t+1}\right)$	0.137	0.178	-0.089
	(2.128)**	(2.264)	(-1.001)
Residual return contribution: unquoted securities historic average, linear, $\left(RRC_{nus,hist}\right)$	0.464	0.330	0.500
	(2.338)**	(1.748)*	(2.042)**
Residual return contribution: unquoted securities historic average, cubic, $\left(RRC_{nus,hist}\right)^3$	-8.262	-8.415	-15.906
	(-4.391)***	(-5.214)***	(-3.185)***
Residual return contribution: quoted securities historic average, linear, $\left(RRC_{nqs,hist}\right)$	0.144	0.151	0.130
	(1.437)	(1.666)*	(1.277)
Residual return contribution: administrative expenses in period 1, $\left(RRC_{adm,1}\right)$	7.768	9.314	7.876
	(3.367)***	(2.488)**	(3.479)***
Residual return contribution: taxes in period 1, $\left(RRC_{tax,t}\right)$	2.375	0.129	0.891
	(2.863)***	(0.084)	(0.715)
Adj R^2	**0.606**	**0.501**	**0.245**
F-statistic	**70.632**	**38.111**	**9.477**
No obs	**212**	**173**	**101**

Table A6.8.4 cont. Regression model according to equation 6.2. T-statistics are presented within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	Sweden sphere companies	Sweden pure companies
Panel D: Firm-year observations July 1981 - December 2004, with controls			
Residual return contribution: unquoted securities in period 1, $(RRC_{nus,t+1})$	0.291	0.314	0.008
	(4.732)***	(4.139)***	(0.085)
Residual return contribution: unquoted securities historic average, linear, $(RRC_{nus,hist})$	0.705	0.730	0.669
	(3.810)***	(3.670)***	(2.314)**
Residual return contribution: unquoted securities historic average, cubic, $(RRC_{nus,hist})^3$	-8.300	-8.108	-10.189
	(-5.378)***	(-5.611)***	(-1.544)
Residual return contribution: quoted securities historic average, linear, $(RRC_{nqs,hist})$	0.155	0.122	0.172
	(1.615)	(1.242)	(1.684)*
Residual return contribution: administrative expenses in period 1, $(RRC_{adm,1})$	4.794	6.036	16.749
	(1.237)	(1.340)	(2.571)**
Residual return contribution: taxes in period 1, $(RRC_{tax,t})$	0.661	-2.400	-2.522
	(0.438)	(-1.736)*	(-1.806)*
Portfolio concentration (PCON)	0.376	0.355	0.324
	(4.920)***	(2.781)***	(1.748)*
Votes-to-capital * portfolio concentration (M_1)	-0.172	-0.166	-0.180
	(-6.130)***	(-1.953)*	(-1.074)
Adj R^2	**0.650**	**0.607**	**0.398**
F-statistic	**44.239**	**32.890**	**9.984**
No obs	**154**	**137**	**81**

Table A6.8.4 cont. Regression model according to equation 6.4. T-statistics are presented within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

Appendix 6.9 Regression results using ordinary least squares and matched samples, i.e. the same observations without the control variables

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel A: Firm-year observations December 1972 - December 2004				
Residual return contribution: net asset value in period 1, $(RRC^{eat}_{nav,1})$	0.140		0.079	0.071
	(2.752)***		(1.589)	(1.350)
Residual return contribution: unquoted securities in period 1, $(RRC_{nus,1})$	0.238		0.139	0.008
	(3.305)***		(1.889)*	(0.072)
Residual return contribution: net asset value historic average, linear, $(RRC^{eat}_{nav,hist})$	0.566		0.545	0.006
	(4.076)***		(4.134)***	(0.046)
Residual return contribution: net asset value historic average, cubic, $(RRC^{eat}_{nav,hist})^3$	-5.116		-5.308	2.283
	(-4.948)***		(-5.488)***	(1.330)
Residual return contribution: unquoted securities historic average, linear, $(RRC_{nus,hist})$	0.702		0.594	0.117
	(3.784)***		(3.028)***	(0.387)
Residual return contribution: unquoted securities historic average, cubic, $(RRC_{nus,hist})^3$	-8.485		-8.410	-5.784
	(-5.766)***		(-5.795)***	(-0.754)
Residual return contribution: quoted securities historic average, linear, $(RRC_{nqs,hist})$	0.210		0.250	0.214
	(1.558)		(1.982)**	(1.843)*

Table A6.9.1: Estimated coefficients on residual return contributions from different regression using a matched sample with the sample including control variables. Regressions according to equations 6.1 and 6.2. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

Panel B: Firm-year observations July 1981 - December 2004				
Residual return contribution: net asset value in period 1, $\left(RRC^{eat}_{nav,1}\right)$	0.152	-0.049	0.092	0.055
	(2.936)***	(0.020)**	(1.823)*	(1.061)
Residual return contribution: unquoted securities in period 1, $\left(RRC_{nus,1}\right)$	0.276		0.183	0.142
	(3.791)***		(2.465)**	(1.008)
Residual return contribution: net asset value historic average, linear, $\left(RRC^{eat}_{nav,hist}\right)$	0.630	0.229	0.615	1.030
	(4.483)***	(0.043)***	(4.612)***	(0.602)
Residual return contribution: net asset value historic average, cubic, $\left(RRC^{eat}_{nav,hist}\right)^3$	-5.451	-0.197	-5.688	-0.006
	(-5.245)***	(0.042)***	(-5.871)***	(-0.056)
Residual return contribution: unquoted securities historic average, linear, $\left(RRC_{nus,hist}\right)$	0.785		0.711	0.361
	(4.226)***		(3.613)***	(1.188)
Residual return contribution: unquoted securities historic average, cubic, $\left(RRC_{nus,hist}\right)^3$	-8.967		-9.096	-9.480
	(-6.127)***		(-6.297)***	(-1.268)
Residual return contribution: quoted securities historic average, linear, $\left(RRC_{nqs,hist}\right)$	0.233		0.254	0.236
	(1.735)*		(2.036)**	(2.084)

Table A6.9.1 cont. Regressions according to equations 6.1 and 6.2. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

Appendix 6.10 Regression results using time dummies for each year

Tables A6.10.1 and A6.10.2 include estimates when residual returns are measured using market risk adjustments.

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel A: Firm-year observations December 1972 - December 2004, no controls				
Residual return contribution: net asset value in period 1, $\left(RRC^{eat}_{nav,1}\right)$	0.127	-0.007	0.128	0.137
	(1.973)**	(-0.616)	(2.126)**	(1.989)**
Residual return contribution: net asset value historic average, linear, $\left(RRC^{eat}_{nav,hist}\right)$	0.539	0.236	0.235	-0.343
	(2.933)***	(8.100)***	(1.268)	(-2.409)**
Residual return contribution: net asset value historic average, cubic, $\left(RRC^{eat}_{nav,hist}\right)^3$	-4.672	-0.201	-4.939	4.794
	(-1.858)*	(-5.324)***	(-1.937)*	(2.209)**
Residual return contribution: administrative expenses in period 1 , $\left(RRC_{adm,1}\right)$	3.890	0.702	1.788	6.751
	(1.234)	(2.437)**	(0.420)	(2.760)***
Residual return contribution: taxes in period 1, $\left(RRC_{tax,t}\right)$	1.204	1.563	-0.149	1.668
	(1.037)	(3.657)***	(-0.068)	(1.757)*
Constant	-0.320	-0.283	-0.264	-0.262
	(-10.541)***	(-31.481)***	(-11.967)***	(-13.119)***
Adj R^2	**0.178**	**0.339**	**0.159**	**0.173**
F-statistic	**2.929**	**35.264**	**2.366**	**2.048**
No obs	**286**	**2203**	**217**	**136**

Table A6.10.1: Regression analysis of premiums on excess returns on net asset value. Regression model according to equation 6.1. T-statistics are presented within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel B: Firm-year observations December 1972 - December 2004, with controls				
Residual return contribution: net asset value in period 1, $\left(RRC_{nav,1}^{eat}\right)$	0.188		0.094	0.043
	(2.407)**		(1.526)	(0.606)
Residual return contribution: net asset value historic average, linear, $\left(RRC_{nav,hist}^{eat}\right)$	0.425		0.244	0.171
	(2.156)**		(1.217)	(1.005)
Residual return contribution: net asset value historic average, cubic, $\left(RRC_{nav,hist}^{eat}\right)^3$	-4.157		-4.090	-5.011
	(-1.606)		(-1.673)*	(-1.594)
Residual return contribution: administrative expenses in period 1, $\left(RRC_{adm,1}\right)$	10.798		15.863	9.676
	(3.862)***		(2.436)**	(4.581)***
Residual return contribution: taxes in period 1, $\left(RRC_{tax,t}\right)$	-0.054		-0.395	-0.923
	(-0.036)		(-0.182)	(-0.723)
Portfolio concentration (PCON)	0.251		0.484	0.373
	(2.764)***		(4.330)***	(3.811)***
Portfolio concentration (PCON) * Dum	-0.616		-0.440	-0.342
	(-3.451)***		(-2.664)***	(-2.409)**
Votes-to-capital * portfolio concentration (M_1)	-0.104		-0.350	-0.218
	(-2.147)**		(-3.716)***	(-2.328)**
Constant	-0.062		-0.126	-0.165
	(-0.887)		(-1.765)*	(2.602)**
Adj R^2	**0.232**		**0.366**	**0.491**
F-statistic	**2.528**		**3.612**	**3.829**
No obs	**163**		**146**	**89**

Table A6.10.1 cont. Regression model according to equation 6.3. T-statistics are presented within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel C: Firm-year observations July 1981 - December 2004, no controls				
Residual return contribution: net asset value in period 1, $\left(RRC^{eat}_{nav,1}\right)$	0.124	-0.012	0.118	0.175
	(1.778)*	(-1.026)	(1.805)*	(2.517)**
Residual return contribution: net asset value historic average, linear, $\left(RRC^{eat}_{nav,hist}\right)$	0.715	0.244	0.271	-0.153
	(3.509)***	(7.938)***	(1.373)	(-1.065)
Residual return contribution: net asset value historic average, cubic, $\left(RRC^{eat}_{nav,hist}\right)^3$	-5.463	-0.207	-5.133	3.286
	(-2.210)**	(-5.356)***	(-1.978)**	(1.599)
Residual return contribution: administrative expenses in period 1, $\left(RRC_{adm,1}\right)$	4.219	0.658	1.884	8.974
	(1.266)	(2.212)**	(0.392)	(3.797)***
Residual return contribution: taxes in period 1, $\left(RRC_{tax,t}\right)$	1.874	1.567	0.429	1.702
	(1.456)	(3.127)***	(0.173)	(2.122)**
Constant	-0.209	-0.276	-0.255	-0.248
	(-6.176)***	(-25.120)***	(-8.351)***	(-9.572)***
Adj R^2	**0.134**	**0.240**	**0.140**	**0.226**
F-statistic	**2.311**	**23.948**	**2.120**	**2.271**
No obs	**212**	**1964**	**173**	**101**

Table A6.10.1 cont. Regression model according to equation 6.1. T-statistics are presented within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	UK all companies	Sweden sphere companies	Sweden pure companies
Panel D: Firm-year observations July 1981 - December 2004, with controls				
Residual return contribution: net asset value in period 1, $\left(RRC^{eat}_{nav,1}\right)$	0.198	-0.050	0.103	0.057
	(2.519)**	(-2.560)**	(1.647)	(0.775)
Residual return contribution: net asset value historic average, linear, $\left(RRC^{eat}_{nav,hist}\right)$	0.438	0.245	0.258	0.250
	(2.247)**	(5.206)****	(1.305)	(1.438)
Residual return contribution: net asset value historic average, cubic, $\left(RRC^{eat}_{nav,hist}\right)^3$	-4.227	-0.192	-4.162	-5.041
	(-1.662)*	(-4.302)***	(-1.730)*	(-1.579)
Residual return contribution: administrative expenses in period 1, $\left(RRC_{adm,1}\right)$	10.741	0.960	15.614	10.164
	(3.873)***	(0.930)	(2.417)**	(4.803)***
Residual return contribution: taxes in period 1, $\left(RRC_{tax,t}\right)$	-0.092	2.378	-0.523	-1.450
	(-0.061)	(2.682)***	(-0.247)	(-1.142)
Portfolio concentration (PCON)	0.249	0.081	0.481	0.377
	(2.773)***	(0.965)	(4.336)***	(3.784)***
Votes-to-capital * portfolio concentration (M_1)	-0.104		-0.348	-0.211
	(-2.186)**		(-3.728)***	(-2.176)**
Beneficial owner percentage * portfolio concentration (M_3)		-0.810		
		(-2.982)***		
Constant		-0.119	-0.321	-0.302
		(-6.637)***	(-6.466)***	(-6.509)***
Adj R^2	**0.242**	**0.130**	**0.374**	**0.471**
F-statistic	**2.810**	**5.518**	**4.014**	**3.852**
No obs	**154**	**365**	**137**	**81**

Table A6.10.1 cont. Regression model according to equation 6.3. T-statistics are presented within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	Sweden sphere companies	Sweden Pure companies
Panel A: Firm-year observations December 1972 - December 2004, no controls			
Residual return contribution: unquoted securities in period 1, $(RRC_{nus,t+1})$	0.124	0.088	0.144
	(1.480)	(0.955)	(1.173)
Residual return contribution: unquoted securities historic average, linear, $(RRC_{nus,hist})$	0.563	0.173	-0.383
	(2.384)**	(0.624)	(-1.334)
Residual return contribution: unquoted securities historic average, cubic, $(RRC_{nus,hist})^3$	-6.378	-7.246	6.915
	(-1.828)*	(-2.073)**	(0.803)
Residual return contribution: quoted securities historic average, linear, $(RRC_{nqs,hist})$	0.377	0.088	-0.136
	(1.708)*	(0.665)	(-0.904)
Residual return contribution: administrative expenses in period 1, $(\mathrm{RRC}_{\mathrm{adm},1})$	3.984	2.019	4.877
	(1.392)	(0.514)	(1.892)*
Residual return contribution: taxes in period 1, $(\mathrm{RRC}_{\mathrm{tax},1})$	1.052	-0.095	2.064
	(0.834)	(-0.042)	(2.035)**
Constant	-0.317	-0.268	-0.304
	(-10.348)***	(-9.340)***	(-6.438)***
Adj R^2	**0.184**	**0.175**	**0.119**
F-statistic	**2.941**	**2.347**	**1.538**
No obs	**286**	**217**	**136**

Table A6.10.2: Regression analysis of premiums on excess returns on quoted and unquoted securities on Swedish data. Regression model according to equation 6.2. T-statistics are presented within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	Sweden sphere companies	Sweden pure companies
Panel B: Firm-year observations December 1972 – December 2004, with controls			
Residual return contribution: unquoted securities in period 1, $\left(RRC_{nus,t+1}\right)$	0.267	0.157	-0.011
	(2.596)**	(1.749)*	(-0.096)
Residual return contribution: unquoted securities historic average, linear, $\left(RRC_{nus,hist}\right)$	0.600	0.346	-0.045
	(2.080)**	(1.093)	(-0.156)
Residual return contribution: unquoted securities historic average, cubic, $\left(RRC_{nus,hist}\right)^3$	-7.182	-6.844	-3.498
	(-2.132)**	(-2.060)**	(-0.456)
Residual return contribution: quoted securities historic average, linear, $\left(RRC_{nqs,hist}\right)$	0.089	0.027	-0.010
	(0.613)	(0.216)	(-0.076)
Residual return contribution: administrative expenses in period 1, $\left(\mathrm{RRC}_{\mathrm{adm},1}\right)$	10.066	14.846	9.218
	(3.670)***	(2.454)**	(4.293)***
Residual return contribution: taxes in period 1, $\left(\mathrm{RRC}_{\mathrm{tax},t}\right)$	-0.071	-0.682	-0.828
	(-0.046)	(-0.319)	(-0.627)
Portfolio concentration (PCON)	0.286	0.487	0.366
	(3.470)***	(4.678)***	(3.638)***
Portfolio concentration (PCON) * Dum	-0.670	-0.498	-0.323
	(-3.010)***	(-2.557)**	(-2.236)**
Votes-to-capital * portfolio concentration (M_1)	-0.112	-0.328	-0.207
	(-2.545)**	(-3.784)***	(-2.138)**
Constant	-0.056	-0.117	-0.172
	(-0.620)	(-1.414)	(-2.636)**
Adj R^2	**0.283**	**0.413**	**0.462**
F-statistic	**2.939**	**4.087**	**3.436**
No obs	**163**	**146**	**89**

Table A6.10.2 cont. Regression model according to equation 6.4. T-statistics are presented within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	Sweden sphere companies	Sweden pure companies
Panel C: Firm-year observations July 1981 - December 2004, no controls			
Residual return contribution: unquoted securities in period 1, $(RRC_{nus,t+1})$	0.114	0.128	0.050
	(1.202)	(1.469)	(0.398)
Residual return contribution: unquoted securities historic average, linear, $(RRC_{nus,hist})$	0.761	0.249	0.101
	(2.911)***	(0.832)	(0.330)
Residual return contribution: unquoted securities historic average, cubic, $(RRC_{nus,hist})^3$	-7.674	-7.663	-1.953
	(-2.233)**	(-2.185)**	(-0.230)
Residual return contribution: quoted securities historic average, linear, $(RRC_{nqs,hist})$	0.513	0.119	0.048
	(2.213)**	(0.902)	(0.346)
Residual return contribution: administrative expenses in period 1, $(\mathrm{RRC}_{adm,1})$	4.117	2.130	7.309
	(1.358)	(0.468)	(2.856)***
Residual return contribution: taxes in period 1, $(\mathrm{RRC}_{tax,t})$	1.583	-0.053	1.604
	(1.115)	(-0.021)	(1.809)*
Constant	-0.223	-0.266	-0.263
	(-7.052)***	(-9.526)***	(-9.899)***
Adj R^2	**0.148**	**0.174**	**0.109**
F-statistic	**2.406**	**2.396**	**1.510**
No obs	**212**	**173**	**101**

Table A6.10.2 cont. Regression model according to equation 6.2. T-statistics are presented within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

	Sweden all companies	Sweden sphere companies	Sweden pure companies
Panel D: Firm-year observations July 1981 - December 2004, with controls			
Residual return contribution: unquoted securities in period 1, $(RRC_{nus,t+1})$	0.291	0.185	-0.062
	(2.848)***	(2.006)**	(-0.544)
Residual return contribution: unquoted securities historic average, linear, $(RRC_{nus,hist})$	0.631	0.390	0.067
	(2.211)**	(1.245)	(0.223)
Residual return contribution: unquoted securities historic average, cubic, $(RRC_{nus,hist})^3$	-7.385	-7.102	-5.449
	(-2.249)**	(-2.203)**	(-0.698)
Residual return contribution: quoted securities historic average, linear, $(RRC_{nqs,hist})$	0.082	0.018	0.091
	(0.572)	(0.146)	(0.683)
Residual return contribution: administrative expenses in period 1, $(RRC_{adm,1})$	9.943	14.343	9.447
	(3.635)***	(2.387)**	(4.349)***
Residual return contribution: taxes in period 1, $(RRC_{tax,1})$	-0.111	-0.918	-1.330
	(-0.073)	(-0.443)	(-1.014)
Portfolio concentration (PCON)	0.286	0.486	0.382
	(3.526)***	(4.706)***	(3.766)***
Votes-to-capital * portfolio concentration (M_1)	-0.114	-0.324	-0.204
	(-2.632)***	(-3.776)***	(-2.048)**
Constant	-0.366	-0.351	-0.326
	(-6.813)***	(-7.852)***	(-7.762)***
Adj R^2	**0.302**	**0.428**	**0.443**
F-statistic	**3.362**	**4.642**	**3.448**
No obs	**154**	**137**	**81**

Table A6.10.2 cont. Regression model according to equation 6.4. T-statistics are presented within parentheses. * statistically significant coefficients at the 10 % level, ** at the 5 % level and *** at the 1 % level using White standard errors.

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