Volatility, Integration and Grain Banks.

Studies in Harvests, Rye Prices and Institutional Development of the Parish *Magasins* in Sweden in the 18th and 19th Centuries.

Bengt Åke Berg

AKADEMISK AVHANDLING

Som för avläggande av ekonomie doktorsexamen
vid Handelshögskolan i Stockholm
framläggs för offentlig granskning
den 12 juni 2007 kl. 10.15
i sal 550 , Handelshögskolan, Sveavägen 65

Volatility, Integration and Grain Banks.

Studies in Harvests, Rye Prices and Institutional Development of the Parish *Magasins* in Sweden in the 18th and 19th Centuries.

STOCKHOLM SCHOOL
OF ECONOMICS
HANDELSHÖGSKOLAN I STOCKHOLM

EFI, The Economic Research Institute

EFI Mission
EFI, the Economic Research Institute at the Stockholm School of Economics, is a scientific institution that works independently of economic, political and sectional interests. It conducts theoretical and empirical research in the management and economic sciences, including selected related disciplines. The Institute encourages and assists in the publication and distribution of its research findings and is also involved in the doctoral education at the Stockholm School of Economics. At EFI, the researchers select their projects based on the need for theoretical or practical development of a research domain, on their methodological interests, and on the generality of a problem.

Research Organization
The research activities at the Institute are organized into 21 Research Centres.
Centre Directors are professors at the Stockholm School of Economics.

EFI Research Centre:	**Centre Director:**
Management and Organisation (A)	Sven-Erik Sjöstrand
Centre for Entrepreneurship and Business Creation (E)	Carin Holmquist
Public Management (F)	Nils Brunsson
Information Management (I)	Mats Lundeberg
Centre for People and Organization (PMO)	Andreas Werr (acting)
Centre for Innovation and Operations Management (T)	Christer Karlsson
Economic Psychology (P)	Guje Sevón
Centre for Consumer Marketing (CCM)	Magnus Söderlund
Centre for Information and Communication Research (CIC)	Per Andersson (acting)
Marketing, Distribution and Industrial Dynamics (D)	Björn Axelsson
Centre for Strategy and Competitiveness (CSC)	Örjan Sölvell
Centre for Business and Economic History (BEH)	Håkan Lindgren
Accounting and Managerial Finance (B)	Johnny Lind
Centre for Financial Analysis and Managerial Economics in Accounting (BFAC)	Kenth Skogsvik
Finance (FI)	Clas Bergström
Centre for Health Economics (CHE)	Bengt Jönsson
International Economics and Geography (IEG)	Mats Lundahl
Economics (S)	Paul Segerstrom
Economic Statistics (ES)	Anders Westlund
Law (RV)	Johnny Herre
Centre for Tax Law (SR)	Bertil Wiman

Chair of the Board: Professor Carin Holmquist
Director: Associate Professor Filip Wijkström

Address
EFI, Box 6501, SE-113 83 Stockholm, Sweden • Website: www.hhs.se/efi/
Telephone: +46(0)8-736 90 00 • Fax: +46(0)8-31 62 70 • E-mail efi@hhs.se

Volatility, Integration and Grain Banks.

Studies in Harvests, Rye Prices and Institutional Development of the Parish *Magasins* in Sweden in the 18th and 19th Centuries.

Bengt Åke Berg

STOCKHOLM SCHOOL
OF ECONOMICS
HANDELSHÖGSKOLAN I STOCKHOLM

EFI, The Economic Research Institute

Dissertation for the Degree of Doctor of Philosophy, Ph.D
(Economic History)
Stockholm School of Economics 2007

ISBN 978-91-7258-722-9

Keywords:
Agricultural credit, Harvest fluctuations, In kind loans, Price integration, sockenmagasin, Storage, Storehouses.

Printed by:
Partner Print AB, Stockholm 2007

Distributed by:
EFI, The Economic Research Institute
Stockholm School of Economics
PO Box 6501, SE 113 83 Stockholm, Sweden
www.hhs.se/efi

Acknowledgments

Authoring a thesis is a lonely work but it does not mean that you can do it alone. During my work I have more and more realized how absolutely crucial the support from other persons and institutions has been. My debts of gratitude have piled up in a way that I will never be able to repay.

I have particularly strong reasons for gratitude. Having completed a working life career in business and administration I have, as a pensioner, got an opportunity of a new life where I can enjoy one of the most important things in life, to maintain and develop my curiosity. The Stockholm School of Economics has offered me the opportunity to benefit from their research training programs and courses. Professor Håkan Lindgren has been my supervisor and given me an absolutely crucial support with his knowledge, experience and enthusiasm. My fellow PhD students and other participants in the Economic History Seminars have made them very stimulating and instructive. My thanks to the SSE would not be complete if I did not include Britt-Marie Eisler who has always given a helping hand in administrative matters.

During the work I have benefited from comments on drafts of certain parts from Sven Fritz, Erik Lakomaa, Mats Larson and Mats Olsson. Library services are essential for this kind of research and the Library of the Royal Academy of Agriculture and Forestry with its chief librarian Lars Ljunggren has provided very helpful cooperation. Professor Lars G. Sandberg has edited my drafts in a way that does not only deserve my gratitude both also that of the readers. Magnus Jonsson has made the lay out and Gustaf Ekvall has given assistance with the editing of the final version. My close and dear friend Boel Selden painted the watercolour of the parish *magasin* in Boge that graces the cover page. Last, but not least, I wish to thank the former Director of the Regional Archives, *landsarkivet,* in Visby, Tryggve Siltberg, who originally steered me towards a closer examination of the parish *magasins.*

Contents

CHAPTER 1

Introduction

A Volatile Society

In the last quarter of the passed millennium a fundamental change took place that had, and will continue to have a deep impact on our living conditions. The process we call economic growth then started to accelerate. Even if developments often have been uneven and the process itself is somewhat evasive, the long-term trend with accumulated compound percentage increases has been clear enough and it has changed the structure of our societies beyond recognition. The impact is not only obvious but we all take the process for granted. That my childhood took place in a world that was very different from that of my father, and that my children grew up in a world even more different from the one I lived in as a child, that is not a private experience, but I share it with everyone I know. This is a change of regime in our living conditions that fascinates every student of economic history so much that we talk of all sorts of revolutions may they be industrial, agricultural, technological, financial or whatever.

If growth today is the permanent underlying figure of thought for us, then volatility in a corresponding way was equally important for the Early Modern Man. Volatility and growth are closely linked together in the sense that our modern society, although more dynamic, is less volatile than the previous ones were.[1] I am referring to all the risks that characterised the daily life of ordinary people in the Early Modern Society and which completely dominated their lives. There was only one thing they knew for certain: tomorrow can be very different from today. And they were far more aware of that than that the world in fifty years' time would be different.

The likelihood that the next year would bring war, pestilence, harvest failure and hunger was never small. In the 18th century Sweden only every second child survived until the age of 12. The number of deaths per 1000 inhabitants was every year more than 2½ times higher than today. Death was much more common in general and, moreover, the always high rates varied between years as and could in certain years become extremely high, which, is clearly displayed in figure 1.1.

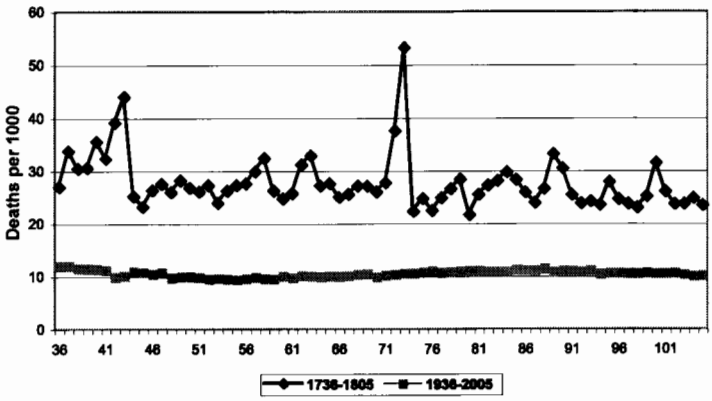


Figure 1.1
Number of deaths per 1000 inhabitants during two sequences, 1736-1805 and 1936-2005 respectively.
Source: Statistics Sweden, web-site.

When it came to factors determining living conditions like grain prices and harvest outcomes, there could be very strong ups and down. Such fluctuations and the risks they carried with them will be a main theme of this study. It is no wonder that the long term annual growth rates, which at a best were a few tenths of one per cent before the acceleration started, were overshadowed by increases or decreases in market prices or individual harvest outcomes of 20 or 30% from one year to another.

Since so many peasants lived on the tiny margin between hunger and seed for next year, harvest failures could be extremely serious particularly with epidemic deceases in tow and the survival of the family could be at risk. That was the case in the years 1772-73, which the chart above shows. In 1771 the harvests failed seriously not only in Sweden but also in large parts of Northern Europe. The Early Modern Peasants were often net buyers of grain, at least in times with harvest failures when prices were high. These peasants suffering heavily from high prices were thus entirely different from modern farmers lobbying for high grain prices. But when they in a good year may have had a surplus to sell, which could have given them money to pay their debts, then there might very well be a market glut that made their outlet difficult. An eloquent author in what he called *A Speech to the Swedish people* expressed it in the following way "When the Eternal Goodness blesses the country with a mild year's crop, when the corn fields promise the richest harvest, then the country man has to sigh heavily and complain bitterly over his fate. In the midst of all the heavy shocks that he harvests he sees his weakening. The price falls, the out let becomes difficult, he is underbid everywhere. He becomes depressed, fed up with his laborious work that gives so little reward."[2] Volatility was thus a serious problem under both deficit and surplus conditions. The contemporary peasants had their rationality but it must be applied to the very different economic, social and institutional realities they faced.

For the Crown the volatility was also threatening since the future supply of peasant taxpayers and of young men available for military conscriptions was at risk, and

both things were important to avoid for a military state as that contemporary state in fact was. At the *bruk,* the iron works, the workers were provided with subsidised grain and high grain prices would also create problems for them and their exports of iron, which was of overwhelming strategic importance to the Realm. There was always a risk for social unrest or peasant uprisings in times of scarcity. The demands of the moral economy to provide relief for the dependent subjects in return for their taxes and rents might have been an obligation for the Crown but relief was something the state shunned and the contemporary state did certainly not see itself as an ultimate guarantor of a welfare state. During the severe famines in the 1690s the peasants of Lower and Upper Hollola district in Finland asked the king for deferment of their repayments of grain loan and they humbly pointed out that unless they got it they would have to die "to the great detriment of Your Royal Majesty". But at least sometimes the Central Power could be relaxed as when the Governor of Scania stated that although the famine in 1696 was such that "men had died and that the farms therefore lay deserted" there was no need for the Crown to be anxious since "there is such a plenitude of people that we could do well without some part of them"[3]

A great number of civil servants, military officers, pastors, deans, university professors and bishops had their income from the Crown in grain through the Swedish allotments system (*indelningsverket*), most of which they then had sold to merchants, iron works or brewers. Particularly in the Age of Liberty (1719-72) such tax and rent receivers composed a large share of the political class that acted in the Diet Meetings. For them, and for the owners of the great estates and with surpluses to sell, the other side of volatility, when prices were extraordinary low, was appreciated as a problem.

Most peasants were in a situation where modern economists would have advised them a risk averse strategy and there are indications that they behaved in a way to reduce the volatility or to alleviate its consequences even at the expense of productivity. It is difficult to imagine that they did not do everything in their power to protect themselves or at least to accommodate to harvest failures in order to survive. Some time ago economic historians discussed at length whether the peasants' reluctance to abandon the open field system for enclosures was rational or not and some saw it as a sign of just averse risk behaviour[4] that might have reduced productivity. This may have made some sense (see chapter 3) but the peasants had a number of other, probably more efficient ways to cope with the volatility when the markets failed to offer stable conditions. The split between winter and spring grains (rye sown in the early autumn and barley and oats sown in the spring) was more efficient. Efforts to provide additional foods from gardens like cabbage, turnips etc was another way. In most parts of Sweden there were opportunities of fishing in lakes and rivers, hunting and picking berries from the forests. All the ways and means to survive may not seem so pleasant to us. In a letter from the Medical Board (Collegium Medicum) to the king there were recommendations how lives could be saved during famines. It was proposed that lack of food could be compensated by eating "all four-footed animals, both wild and tame, not only horses but also dogs and cats, wolves, martens, badgers, hedge hogs, particularly in soups if the meat was leathery, squirrels." [5]

The peasants often tried to get monetary income from other activities than agriculture. This may not have been very efficient as regards agricultural productivity – and it was frequently criticized in the contemporary discourse – but it was important as diversification of income. Transport of people and goods like iron and coal to and from the iron works[6], burning of char coal and tar, sheep breeding and sale of wool or woollen handicraft, linen and woodworking products, aqua vit distilling are all examples of activities that differentiated the livelihood and brought money that could be used for purchasing grain in times of scarcity. Most of these activities were better suited for areas close to forests and living in such areas often meant less risk than life on the plains even if harvest volatility might have been greater in the forested areas.

The government policies to meet the volatility included traditional means like export bans, employed occasionally in the 17th and almost permanently in the 18th century. Another was the regulation of domestic grain trade but without particularly concrete results i.a. because the most important purchasers, the iron works were exempted. Public relief initiatives like lending from The Crown magazines were sometimes employed but there was often great reluctance expressed and efforts made to avoid it.

Against this background it is natural that there was in the contemporary political discourse a demand for new institutions where the risks of both famines and very low grain prices, in short the price volatility were addressed. In line with the research traditions of the Institute for Research in Economic History at the Stockholm School of Economics which very much have been focused on the development of institutions for credits and finance, it has been natural to look for ways and means relating to volatility of living conditions in the Early Modern Period. One such institution that gained much attention, particularly during the Age of Liberty (1719-72) as a way to reduce the risks and the volatility problem, was the establishment of the so called *sockenmagasin* (parish storehouses). After endless years of discussions without results, the institution suddenly became very widespread in at least parts of the country and remained so during a period that lasted more than a hundred years from 1750 to 1860 or 1870s. They had a number of traits that made them rather singular. In a way they became credit institutions since they were lenders that received a handsome interest, but they lent grain instead of money. They had a character of ownership that was neither entirely clear for contemporaries nor for us today. Their institutional form varied and was never exactly defined. They were certainly not state owned but they were not private personal property either since a parish member or shareowner did not have the right to withdraw or sell his capital share unless he moved away from the parish. The profits were initially sometimes paid as dividends but later on generally used for collective purposes in the parishes.

Literature and Previous Research Concerning the Swedish *Magasin*

The earliest scholarly study of the Swedish parish *magasins* was published in 1896 in Germany. Part of a wide ranging survey of grain policies in various European countries, it was largely descriptive in nature.[7] The only comprehensive Swedish work on the subject, authored by Karl Åmark, followed in 1915. He devoted an entire chapter of 26 pages to the *magasins* as part of his broad, and still unsurpassed, study of the Grain Trade and Grain Policy in Sweden, 1719-1830. The principal sources for this work were the records of the Diet, the Royal Council and the Administrative Boards, as well as letters and reports from various county governors. In addition, Åmark made use of the Royal Academy of Agriculture's 1832 survey. He concluded that the parish *magasins*' purpose was "to prevent misery and costly grain". In his eyes, they were "a type of savings bank, of the most primitive kind", which in the Swedish context was a "a unique form of relief institution". [8]

Since then Swedish research has only dealt with the parish *magasins* tangentially. Some particular aspects of the institution have been discussed as part of studies primarily dealing with other topics. Thus, for example, K.J. Johansson's work on parish self-government in Sweden 1686-1862 provides information about the managers and activities of some parish *magasins* in the dioceses of Linköping and Kalmar. According to him, the activities of the *magasins* reflected "The ability and spirit for developing communal enterprises in the parishes". Their participation in self-government, under the leadership of their pastor, taught the peasants to cooperate, both among themselves and with persons of higher standing, to achieve common goals according to Johansson, who also added his conclusion that this involvement decreased social tensions and fostered mutual understanding.[9]

Karin Bergström has studied the role of pastors in Swedish agrarian society, 1720-1806. Her work was focused on the Deanery of Oland Frösåker, located approximately 70 kilometres north of Stockholm.[10] She was able to identify 16 cases within the Deanery where a single individual could be credited with initiating the establishment of a parish *magasin*. Of these six were clergymen. She also concluded that the motivation frequently had been to finance poor relief or education. At least in the parish of Alunda she felt that the pastor's behaviour as regards the *magasins* resembled that of a modern businessman. More generally, Bergström noted that the history of the *magasins* had yet to be written, and, consequently, that the practical aspects of their operations remained unexplored.

Petter Aronsson and Alberto Tiscornia, at the Universities of Lund and Uppsala respectively, studied Swedish local self-government during the 18th and early 19th centuries. Both of them based their research on three different parishes. In Aronson's case these were located in Kronoberg County in the province of Småland while Tiscornia relied on parishes in Södermanland and Västmanland Counties.[11] Aronsson reported on parish meeting discussions from 1784 concerning the

establishment of *magasins* held at the urging of the county governor. In all three cases the reluctance of the peasants prevailed and no *magasins* were established. By contrast, each of Tiscornia's parishes, located in counties well supplied with *magasins,* had one. He observed that questions concerning these *magasins* played a prominent role in the parish meetings. How these were conducted was clearly affected by whether a given parish was dominated by a single large estate or by a large number of free holders.[12]

In his broad study of violence and the civilizing process in Sweden 1759-1870, Johan Söderberg (1999) focused on the regional distribution of the *magasins* and of their assets. He used the data of Åmark (1915) that originated with the Royal Academy of Agriculture. He detected the existence of considerably more cooperation in Middle Sweden than in the southern and western parts of the country. Less government crisis relief also seems to have been provided in those counties with relatively high per capita levels of *magasin* assets.[13]

Roger Öhrman's general survey of the *magasins* on Gotland includes descriptions of the surviving buildings. A similar overview of a number of *magasins* in Stockholm County has been assembled by Lotta Lindberg.[14]

The *magasins* in Finland have been the primary subject of a number of studies. Thus, for example, Ilka Teerijokki has published an article describing their development in the two Finnish counties of Nyland and Tavastehus during the Swedish period. He then continued his work with a dissertation, written in Finnish, covering all of Finland during that same period.[15]

Non-Swedish Studies of Similar Institutions

Central government initiatives to establish local grain storage systems were not unique to Sweden. Similar policies were followed in a number of other countries. A brief review of these indicates that there were both similarities and differences. A comparative study would certainly be worthwhile, but it cannot be done here. I will instead limit myself to a few general observations based on the existing literature.

Spain

The early history of the local storehouses, the *positos,* remains unclear. While they may have had their roots in the Middle Ages, it was during the reign of Philip II that they became important. In 1584, Philip issued a decree regulating their activities and management. According to a contemporary observer in 1558 there were some 12 000 *positos* in Spain.[16]

There were two types of *positos,* civil and religious. The first group was the result of national or local government initiatives, while the second was church inspired. A declared goal of those with government origins was to stabilize the price of bread in times of scarcity. Their church based compatriots were primarily charities. In both cases, however, the provision of agricultural credit became an

increasingly important function. The *positos* were administered by individuals selected by town councils, landlords or church councils, and were subject to the authority either of the Council of Castile or of the district courts.

The *positos* provided loans in grain that were to be repaid with the addition of so-called *creces* (increases) that is to say interest. The rate charged usually amounted to one half of a *celemin* (4.625 litres) per *fanega* (55.5 litres), corresponding to 4.16%. *Positos* that succeeded in accumulating sufficient funds sometimes provided financial support to various social programs, such as elementary education, public health or the construction of roads, bridges and public buildings.

In 1751 a royal ordinance centralizing all *positos* was issued. A side effect of this action was that detailed statistical data concerning the *positos* began to be collected. In 1751 there existed 3371 royal *positos*, a number that had grown to 5225 by 1773. In addition, there were 2865 religious *positos* for a grand total of more than 8000. Of their total assets 88% was wheat, either in the form of grain or of meal. The remainder consisted of 2% in "minor" grains and 10% in money. The distribution of total assets per inhabitant among provinces was very uneven. In the northern coastal provinces the *positos* were either rare on nonexistent, while along the Mediterranean coast their per capita assets were far below the national average. The highest per capita values were recorded in the middle of the Iberian Peninsula and in the south, especially in certain parts of Andalusia. The mix of royal and religious *positos* varied. The religious institutions dominated Burgos and Soria but were in a minority elsewhere. Although the number of Royal *positos* increased only slightly up to 1793, their assets grew by more than 25%. The end of the 18th century marked the zenith of the *posito* institution. By the mid 19th century more than 1800 royal *positos* had ceased to exist.

The central governance of the *positos* took various forms. Sometimes there was a special superintendency; at other times the Council of Castile exercised direct control. Numerous regulations were issued and were printed together in a book with the relevant laws and ordinances.

When the government, starting in 1798, requested a number of "extraordinary contributions", *posito* activities went into decline. During the early 19th century the Napoleonic wars in Spain further contributed to the demise of the institution. Later in the century there were some attempts to revive the *positos*, but they obviously were never able to regain their previous importance.

Italy

The Italian institution of the *Monti di Pieta* emerged in the late 15th century.[17] It was promoted by the Franciscans as a source of small, usury free, loans. In 1515 Pope Leo X issued a bull permitting the charging of moderate interest rates. The *Monti di Pieta* were a sort of pawn shops where a personal pledge served as collateral. They were principally an urban phenomenon, but the *Monti Frumentari* were created to serve as a rural equivalent lending grain instead of cash. The earliest examples of *Monti Frumentari* date back to the late 15th century. In fact, they may have pre-dated the Spanish *positos*. The *Monti Frumentari*,

however, did not become widespread until the 18th century on initiatives taken in 1697 by Cardinal Orsini. After the cardinal ascended the throne of St. Peter in 1724, he continued to promote them. The Concordat of 1741 placed the *Monti Frumentari* under the central control of a so-called mixed tribunal consisting of both ecclesiastical and lay counsellors.

Before the end of the 18th century there were more than 800 *Monti Frumentari* scattered unevenly across Italy. Almost two thirds were in the south, the *Mezzogiorno,* with approximately one fifth each in the centre and the north. They were concentrated in areas distant from urban centres where well-functioning grain markets were absent and there was a chronic shortage of cash. A major objective was to eliminate the usurious *"contratti alla voce"* system, under which the peasants borrowed seed from a trader at a very high price or value (*voce)* and repaid him at low post-harvest prices. The effective rate of interest could amount to 30%.

The *Monti Frumentari* implicitly charged interest by issuing loans in level measure (*"alla rasia dello staio")* and requiring repayment in full (presumably heaping) measure (*"alla colma dello staio").* The difference, referred to as a half measure (*"mezzo stopello"),* was slightly over 6%. Reports that an additional measure frequently was demanded can also be found. The government made a number of, clearly ineffective, attempts to stop this abuse.

In the Kingdom of Naples, where most of the *Monti Frumentari* were located, a number of agrarian reforms were planned during the 1780s. Since most of the *Monti Frumentari* did not function satisfactorily, one central such institution for the entire Kingdom was contemplated. It was to serve as a kind of central bank for the local *Monti Frumentari.* Much of the capital provided for this institution, however, was siphoned off and used for entirely different purposes. In the late 1790s a portion was confiscated by the financially troubled Treasury of the Kingdom. With the coming of war the situation became even worse. The French conquerors had little interest in reviving the *Monti Frumentari* system, which they considered a feudal remnant. Following the restoration of the Bourbons efforts were made to reinvigorate the *Monti,* and their activities continued until the middle of the 19th century.

Russia

In 1762 Catherine the Great appointed a special commission to implement her decree to "establish granaries in all cities in order to always keep prices in my hand". The commission foresaw problems with state-operated granaries and instead suggested that they be established by municipal authorities and major landowners. Farmers on crown land and two years later also those on private lands were required to establish granaries. When the peasants were ordered to replenish the granaries in 1771, the system was put on a more permanent footing, and it was eventually codified into law in 1799.[18]

The Napoleonic invasion of 1812 resulted in the destruction or depletion of a great many granaries. When these were re-established, there were a strong division of opinion as to whether they should provide emergency relief in grain

or in cash. In 1822 Tsar Nicholas I tried to resolve the dispute. It was legally stipulated that provincial government committees, on the basis of available grain production, transport facilities, the nature of local industries and the feasibility of restocking the granaries, should choose between grain and cash. As a result, 40 provinces opted for grain and 12 for cash.

On loans of grain the interest rate was 6%. Where monetary funds existed, cash or purchased grain could be lent at the discretion of the local authorities. Serf borrowers were required to provide collateral, either by pawn or caution from the landlord. For crown serfs, the government dedicated a communal field to each local granary.

A number of poor harvests demonstrated the inability of the 1822 law to deal with a province-wide crop failure. Consequently, a new law, which with only minor modifications remained in effect for the rest of the century, was enacted in 1834. The long-standing debate of grain versus cash was resolved by requiring both. The lending of money needed approval from the highest authority in Petersburg, while grain lending was controlled by the local commission. Half the available grain could be lent for seed, while the other half was to be kept in reserve for exceptional food shortages. During the late 1850s efforts were made to improve the system in anticipation of the liberation of the serfs. The responsibility for establishing village granaries rested on the peasant communities.

Norway

In Norway[19] the tradition had been to let the grain, collected for the crown and church tithes, remain in the tithe barn until the following harvest. It thus served as a reserve in case that harvest would fail. This system, however, collapsed in the early 18th century when the debt ridden Danish government sold the churches and their income to private interests. During the 1740s, a discussion concerning the establishment of some type of storehouses made reference to both Swedish and Prussian experience. It was not until 1775, however, that the first so-called *bygdemagasin,* or rural storehouse, was established, and then following a private initiative. In 1789 the Danish government's finance office, the *Rentekammer,* issued a plan for the establishment of *bygdemagasins* in Norway. This action will be seen against the background of the abolition of the Danish monopoly of grain exports to Norway. By 1833 there were 250 *bygdemagasins* holding a total of 117600 hectoliters of grain. During the 1840s, however, the institution went into decline, and the assets were used for communal services or as the initial capital for savings banks.

China

As early as the 12th century, the renowned philosopher Zhu XI (1130-1200) advocated the establishment of communal granaries outside the urban centres.[20] They were to be created and managed by the local population rather than by government officials. In principal, they were to be funded by private contributions, thus giving the wealthy and educated classes the opportunity to feed the population without

direct government intervention. They would be able to serve those who could not reach the ever-normal granaries of the state. These community granaries were small and widely scattered across the Country. The interest they charged was intended to cover operating expenses and permit a gradual increase in their holdings.

During the early Quing Dynasty of the late 17th century communities throughout the empire were encouraged to start their own granaries. There is little evidence of any substantial progress, however, until the Yongzheng reign (1723-36). Calls for the development of community granaries were heard in a number of provinces, but only a few officials or local elites acted. This highly variable response resulted in low provincial totals. Furthermore, many of the successes that were recorded depended on the granting of access to official revenues. Although the emperor frequently allowed the use of official funds to underwrite communal granaries, he was opposed to government management. His participation was thus more financial than organizational. He increased the state's role as a source of initial funding, while still supporting private administration. In those cases where substantial reserves were amassed, however, government officials and funds often played a different set of rules. The emperor had good reason to fear that imperial officials would introduce abuse and bureaucratic meddling.

Imperial officials frequently opposed the creation of communal granaries precisely because they were difficult to monitor, and management was deliberately kept out of their hands. As result, records of the communal granaries' activities are hard to come by.

The reduction in the state's ever-normal granary activities was offset by the expansion of the communal granaries. These, however, required the development of management skills. The officials tried to limit the size of the granaries in order to maintain their supervisory role. Although the Yongzheng Emperor promoted the formation of communal granaries, he failed to resolve the problem of supervision. No systematic control and monitoring procedures were developed. It was not even clear whether the granaries should be small or large. On the one hand, it was difficult to monitor many small operations, while, on the other hand, large grain holdings increased the risk of spoilage. The hope of avoiding spoilage also resulted in compulsory borrowing. Official interference became even more intrusive after 1735, as bureaucratic monitoring of private actions increasingly replaced direct public operation.

During the late 18th and early 19th centuries the regular official auditing of community and charitable granary accounts gradually ceased. The preceding development of the granaries had depended on a foundation that delicately balanced official encouragement and monitoring. Without this official involvement the communal granaries would never have been created and then merged into the larger granary system. By the 1780s the survival of the communal granaries was threatened on two fronts. First, the state's success in enlarging the size of their holdings was not matched by an increased ability to monitor them. Second, provincial officials came to view the granaries as an attractive source of funds for government projects. Several provinces allocated the receipts from the sale of granary reserves to public works. When fiscal resources waned during the

1790s, they were even diverted to military use. In 1799 the Jiaqing Emperor, seeing that the dangers of official abuse outweighed the benefits of official oversight, freed the communal granaries from official monitoring. As a result, only those granaries the local populace were willing to fund and manage could survive.

During the 1820s charitable granaries funded by voluntary contributions received support in the provinces. The governor of Anhui promoted granaries intended solely to sustain the local villagers in case of crop failure. He explicitly excluded government officials from granary management to prevent abuse. The response to his initiative, however, was weak. Any results were entirely dependent on the good will of the district magistrates. During the 1850s the communal granary institution was jolted by devastating civil disorder.

Summary

This brief survey is clearly insufficient for the drawing of any conclusions. Still it does seem possible to distinguish some common characteristics. Central government initiatives seem to have been a necessary, but not sufficient, condition for the creation of these grain storage institutions. Continuing government involvement, however, tended to do more harm than good. In particular, governments had a tendency to seize some of the assets. It is also apparent that these institutions gained in importance as the distance from urban centres with their more efficient markets increased. Finally, charitable intentions were a common motive.

Source Materials

The sources utilized in this study generally fall into one of three categories: 1) records of various branches or agents of the central government, including the county governors, 2) the surveys performed by the Royal Academy of Agriculture, or 3) documents relating to individual parishes. As regards some data like tithe rolls there has been an extensive discussion of their reliability, which is briefly summarized in Appendix C. Records from individual parishes are to some extent preserved, unfortunately to a lesser extent than many other types of parish records. When it has been saved the material is generally kept in the Church Archive Departments of the State regional Archives (*landsarkiv*). The quality of the accountancy material is very variable, it is difficult to overview and there are often parts missing.

Some Limitations

Not long after the middle of the 19th century, the parish *magasins* rapidly declined in importance. Consequently, this thesis pays very little attention to their fate after the mid 1870s. In the northern counties of Jämtland and Västerbotten, there were somewhat similar institutions called *distriktmagasin*. Next door, in Västernorrland

County, in addition to the "ordinary" *magasins*, there were so-called *sparlårar*, literally "savings boxes". Although their purpose was similar to that of the *magasins*, they functioned somewhat differently and they have been excluded from this study. In Gothenburg and Bohus County no *magasins* existed according to the 1832 and 1842 surveys of the Royal Agricultural Academy. Apparently some must have been established later, but they too have been omitted from this study.

Translating Swedish Institutional Terminology

Despite Åmark's observation that the *magasins* were a "for our country unique form of relief institution"[21], I believe that studying them from a comparative international perspective would be an interesting undertaking. An initial, tentative and very limited step in that direction is taken in this study through the short survey earlier in this chapter. This requires that a language accessible not just to Swedes be used. The obvious choice is English. Writing in English, however, raises problems. How should a number of rather idiosyncratic Swedish institutions be labelled? When there are equivalent English terms, they obviously have been used. When no corresponding English institutions exist, the rule has been to use the Swedish terminology in *italics* and an explanation the first time the term occurs. A number of such explanations have been collected in Appendix F. In a few instances, when a term is used very frequently, a similar, but not equivalent, English expression has been used. Thus, for example, the Swedish *landshövding* has been roughly translated as "county governor".

One issue that has caused considerable concern is how to translate the Swedish term *sockenmagasin*. The English word "magazine" has been rejected lest it raise images of glossy journals or guns. The term "parish storehouse" expresses the intent of the advocates of the institution rather well. It is so concrete, however, that it might obscure the institutional character the *sockenmagasins* actually attained. From an institutional perspective it would be preferable to refer to them as "parish grain banks", since that describes their actual function rather well. It does not, however, reflect the intention of their originators or the goals promoted by their advocates in the central government. The problem thus is not truly one of language. Rather it reflects the ambiguity of the concept in Swedish usage and reality. Indeed, it is possible to argue that one principal theme of this study is the transformation of parish storehouses into parish grain banks. It is also of interest to note that the names of similar institutions in Italy and Spain, the *Monti Frumentari* and *Positos*, are generally left untranslated in English texts. These considerations have caused me to opt for also leaving the Swedish term *magasin* untranslated in this thesis, despite the resulting tiresome, but inevitable, repetition of *italics*, for which I apologize to the reader.

Structure of the thesis- Speccifying the questions to be adresssed

The Swedish parish *magasins* can be studied from many different angles. These include architectural history (the buildings), historical sociology (the interaction among social groups), political science (local self-government) and the history of religion (the changing role of the church).

This study, however, is confined to the economic historical aspects of the institution and its development. The purpose here is to study how this institution of parish *magasins* developed, the structure it gained and how they worked. The task ahead is thus to describe and analyze the evolution of the parish *magasins* as an economic institution. Since their intended purpose was to relieve crop failure induced scarcity and to stabilize grain prices, it is necessary to initially study the volatility of harvest outcomes and the variations of grain prices and how prices and harvests interacted. The aim is thus primarily to describe the processes of how the institution developed and how it worked but then secondly to make an attempt to understand and explain the way in which they came to develop, since that was rather different from the original intentions. A fascinating question is why an institution with one purpose comes to change its intended functions to fulfil another. In order to address this issue it will be necessary to pose the *magasin* institution in relation to a great variety of other economic, institutional, historical and environmental circumstances. History differs from economics in that the number of variables that have an impact are much more numerous.

This over-arching objective has spawned a number of more specific subsidiary research topics.

Historical data on grain prices, including their volatility, stretches back further in time than any other statistical evidence. Does their volatility display any long-term trends and did it vary from place to place? These questions are addressed in chapter 2.

Harvest outcomes were crucially dependent on annual weather conditions. What exactly, however, is meant by variations in harvest outcomes? Does it refer to output fluctuations in a particular field, farm, village, parish, county or entire country? The unit chosen will have a major impact on the results. In chapter 3, empirical evidence is used in an attempt to determine some typical quantitative values.

According to economic theory, price is determined by the intersection of the supply and demand schedules. It is generally believed that the price elasticity of demand was low. How is the model affected by the availability of both domestic supply and imports? What is the likely impact of storage? These questions are addressed in chapter 4.

In chapter 5 the hypotheses generated by the theoretical discussion in the previous chapter are subjected to empirical verification. Were there historical occasions when access to imports reduced the volatility of prices and reduced their dependence on domestic harvest outcomes?

Chapter 6 deals with the history of the establishment and evolution of the *magasins*. Were there differences between various periods and regions, and if so can any clear patterns be distinguished? How did the *magasins* develop over time?

The question of how the *magasins* actually functioned is considered in chapter 7. Examples are presented of *magasins* that developed in different periods and under various harvest conditions. How large were the *magasin* loans, what characterized the borrowers, what share of the debtors' total obligations were in the form of *magasin* loans?

In chapter 8 an attempt is made to explain the results reported in the previous chapters: why were so many *magasins* established despite the indifference, or even the hostility, of the parishioners? Once established, why did the *magasins* continue to develop and why in the way they did? What forces motivated their supporters and what made them attractive to borrowers? How can the virtual disappearance of the institution during the last third of the 19th century be explained? In addressing these questions a number of various social and institutional factors have to be approached.

Footnotes

[1] This opinion is however not unanimously shared; a German sociologist has for instance launched a rather popular concept calling our modern world a Risk Society. Beck (1986).
[2] Quoted from Åmark (1915) p. 61, where he quotes from Fischerström, Tal till Svenska folket.
[3] Quoted from Jutikkala (1955).
[4] D. McCloskey (1991) refers to McCloskey (1989), an article that summarizes the earlier work on open field.
[5] Quoted from Utterström (1957a) p. 227.
[6] The iron works activities actually generated more employment in transportation than at the mills.
[7] Naudé (1896) p. 404-448.
[8] Åmark (1915) p. 320-346.
[9] K H Johansson (1937) p. 327-329.
[10] Karin Bergström (1991) p. 140-147.
[11] For the Swedish institution *län* the English "county" has been used. Län were since 1634 clearly defined areas for administrative, fiscal and military purposes. The Swedish *landskap* refers to medieval organisations that played and still play a role for identity feelings but had no legal or administrative significance after 1634, and when used here they will be labelled "province". For an overview of the Swedish counties, see Appendix A.
[12] Petter Aronson (1992); Alberto Tiscornia (1992).
[13] Johan Söderberg (1999) p. 169-71.
[14] Öhrman (1990); Lindberg (2004).
[15] Teerijoki (1987); Teerijoki (1993).
[16] This account is based primarily on Anes Alvarez (1969) and the article *Positos* in Enciclopedia Universal Ilustrada Europeo-American Tomo XLVI (1922).
[17] This account of the Italian experience is based on Avallone (2003).
[18] The account of Russia is based on an article by Nikolai Kablukow (n.d).
[19] The section on the *bygdemagasin* in Norway is based on an article in Salmonsens Konversations lexikon Bind IV (1916) Copenhagen.
[20] Will and Wong (1991) is the source for the section on China.
[21] Åmark (1915) p. 320.

CHAPTER II

Grain Price Volatility

Statistical evidence on the volatility of grain prices can be traced back as far as the 13th century. In many European cities the government authorities tried to avoid social and political unrest by preventing prices from rising sharply. While their efforts along these lines seldom succeeded, they at least have endowed modern historians with widespread and meticulously recorded data on grain prices. Many of these records, which the city authorities collected as a basis for their economic policies, have since long been destroyed. Enough survive, however, to provide economic historians with far more quantitative information on this than on any other sector of the economy.

Since grain prices will on occasion be discussed in the following chapters, it is appropriate to address some issues relating to price statistics. Prices frequently varied substantially in the course of a single year, making seasonal factors important. Grain was harvested only once a year, and then stored until the next harvest. Such storage imposed a number of costs. There were outlays for handling the grain and losses resulting from drying, mould and vermin, not to mention the opportunity cost of capital. Naturally, the seller required a higher price the longer the grain had been stored. Without such a storage premium, it would have been more profitable to sell the grain immediately. Each new harvest, however, re-started the process. The new price once again would be determined by the conditions of demand and supply, with sunk costs becoming totally irrelevant.[1]

In practice, this simple model was complicated by annual fluctuations in supply. Expectation concerning the next harvest inevitably resulted in speculation about future, post-harvest, price levels. Further complexity was added by asymmetrical information and differences in liquidity between buyers and sellers. These market imperfections might have contributed to price fluctuations over the course of the year, and may explain the difficulty encountered in empirically verifying the model.

The observed seasonal pattern of prices thus creates interesting opportunities for the study of the various institutions involved in the grain trade. Unfortunately, such work must wait for a future occasion. In the meantime, however, the problem of seasonality can be mitigated by limiting price comparisons to the same time of the year. Most Swedish annual price quotations, the official market scale prices (*markegångstaxor*), refer to late fall or early winter. International comparisons are

sometimes complicated by prices that are calculated as monthly averages of either the calendar or the harvest year (July-July or August-August).[2]

During some periods and in some countries, the monetary system was in disarray. The minting authority sometimes exploited the situation by debasing the coinage. In some cases even fiat money was issued. Inevitably an over-supply of money resulted in rising nominal prices. In Sweden, where such episodes were rather common, the situation was further complicated by the existence of separate currencies for domestic and international transactions.

Even more confusion was added during long periods when there were two different denominations for the domestic currency. From the early 17th century until 1775 there was both *daler kopparmynt (kmt)* and *daler silvermynt* (*smt*) and then, starting in the 1790s, the currency was divided into *banko (bko)* and *riksgälds (rgs)*. Often, but not always, there existed a fixed, although from time to time adjusted, ratio between them. In order to avoid this monetary confusion, prices in this thesis generally have been recalculated into *specie* currency. For this purpose, I have chosen the Reichsthaler Hamburg Banko (from now on abbreviated HB), a currency that to my knowledge was never minted anywhere. Nonetheless, in Sweden it served as the most common unit of account, at least for international transactions. Here HB represents 25.89 grams of fine silver, an amount slightly more than that contained in the traditional Swedish Riksdaler specie.

The question of which currency should be used to measure historical prices has been highly controversial among scholars. There are three principal alternatives: 1) retain the currency in which the price was originally quoted, 2) convert these coin values into specie, either in grams of silver or else in an internationally currency based on specie (e.g. HB), or 3) recalculate into "fixed prices" by deflating nominal prices using an appropriate price index.

The last of these methods, while commonly used in contemporary economic analysis, is here ruled out by the absence of a suitable price index. In any case, even if such a cost of living index was available, it would make little sense to use it to deflate grain prices. Any cost of living index is based on a weighed basket of consumer purchases. During the period studied, however, grain was by far the largest such consumption item. Thus, a fixed price calculation would involve dividing the price of grain by an index consisting largely of that very same grain price.

Those who criticize the use of a specie conversion argue that it measures not the price of grain, but the barter ratio between two commodities, grain and silver. This ratio, in turn, can be affected as much by shifts in the demand and supply of silver as of grain. Thus rising grain prices in terms of specie simply measure a change in the barter ratio, which, in turn, may be the result, for example, of an inflow of silver from the Americas and have nothing whatsoever to do with the grain market. These contentions, of course, are open to dispute. Without entering into such a discussion, however, my reasons for using specie-converted prices are as follows:

1) The Swedish currency was frequently devalued in relation to silver, for example in 1663-65, 1674-80, 1716-18, 1741-44, 1759-62, 1797-99 and 1810-11. Since, as will be discussed below, Swedish grain prices, which were affected by international prices,

a rise in the nominal price of grain in Sweden might simply reflect the falling value of the Swedish domestic currency. Comparing domestic nominal prices from various locations during times of dramatic monetary change will yield exaggerated measures of correlation since the co-variation in prices will, at least partly, be just a reflection of the general price increases caused by a deterioration of the currency.

2) International comparisons can only be made using specie prices. Merchants of that time relied on internationally accepted, specie-backed, currencies for international transactions. The Swedish *daler kmt* or *smt* was not acceptable abroad or to foreigners. Swedish international merchants thus had no choice but were to use the Riksdaler specie or the HB as a unit of account.

Since volatility was the hallmark of Early Modern Society, it is natural to inquire about its trend. This question can be addressed using an available, extremely long, series of London prices. This series measures grain prices in units of pure silver per liter.[3] The coefficient of variation, CV, for each quarter of a century has been calculated since 1275 and are displayed in figure 2.1. Before the 19th century there seem to be a "natural" level for the CV of about 25 apart from a few periods which were significantly higher and which may have been influenced by political or monetary unrest. After the periods of revolutionary and Napoleonic wars the three last quarters of the 19th century had a clearly lower volatility than all previous periods. There was obviously a long secular trend downward, although not very strong or even.

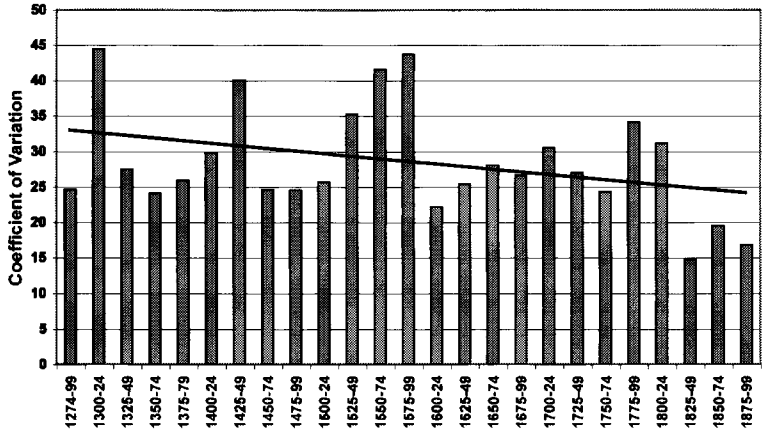
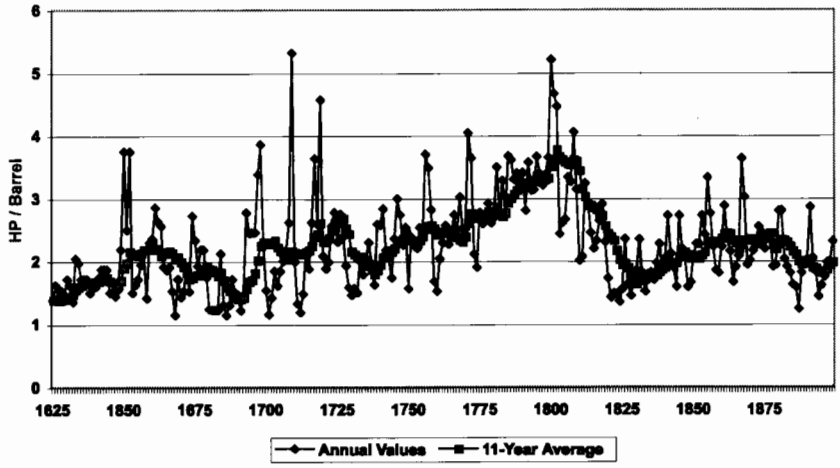


Figure 2.1
Long-term Trend in Volatility of London Wheat Prices, 25-Year Periods, 1274-1899.
Source: Unger web-site.

In Sweden rye prices expressed in HB (equivalent to silver) display a long-term upward trend throughout the entire 17th and 18th centuries, peaking at the beginning of the 19th century. Then followed a period with strong decreases, which eliminated the long-term rise of prices in the 18th century. The evolution of the price of rye in Stockholm in HB per barrel is displayed in figure 2:2, both annually and as an 11- year moving average.



Figur 2.2

Stockholm Rye Prices in HB per Barrel, 1625–1899.

Note. The prices for the period 1625–49 are particularly uncertain, not least because of the transformation into HB.
Sources: Jansson/Söderberg (1991); Hegardt (1975); Lindgren (1971); Jörberg (1972a).
For recalculation to HB: Wolontis (1936), Åmark (1921) and Sveriges Riksbank (1931)

How did price volatility in Stockholm compare with that in other parts of Europe? This question can be answered using the grain price series Unger has collected for a number of European, and Ralph for several German, cities. The price coefficients of variation for Stockholm have been compared with the median of the corresponding values for 30 different European cities.[4] The results are displayed in figure 2.3. This calculation tends to confirm the general impression conveyed by the London series that the second half of the 17th century was more volatile than the 18th century, at least until the outbreak of the Wars of the French Revolution. The very interesting question of why price volatility patterns varied so greatly among various parts of Europe falls outside the scope of this thesis. It does seem apparent, however, that landlocked cities experienced greater volatility than did cities located close to the sea or on large, navigable rivers.

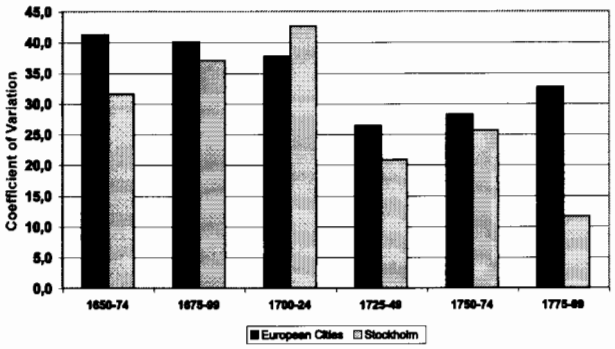


Figure 2.3

Rye Price Volatility in Stockholm Compared with Median for European Cities 1650-1799

Note: Coefficient of Variation calculated on data from Unger and Ralph from 30 European Cities where in each 25-year period only those cities are included where at least 20 annual values are available. The cities included are Aachen, Amsterdam, Angers, Antwerp, Arnhem, Augsburg, Bale, Cologne, Copenhagen, Coutances, Dresden, Düren, Frankfurt, Gdansk, Konigsberg, Krakow, Leipzig, London, Lublin, Lwow, Munich, Speyer, Strasbourg, Toulouse, Udine, Valence, Warsaw, Vienna, Wurzburg, Xanten.
Sources: Unger web-site; Rahlf (1996)

Grain price volatility was certainly a major problem. One interesting conclusion, however, leaps out from the diagram. It was not primarily a Swedish problem. On the contrary, it was somewhat less severe in Sweden than elsewhere. The first quarter of the 18th century is an exception because of the great war and currency problems. The value for Stockholm in the period 1775–99 is remarkably low compared both with other European cities and with other periods in Stockholm both earlier and later.[5]

One way of describing the price volatility in Stockholm is to show how frequent years with strong deviations from trend were. Indexes for annual prices have been calculated based on the average of the eleven preceding years and the frequencies of years with strong deviations from the trend are displayed in table 2.1. In the period 1650–1719 one can see that in 20% of the years, i.e. every five year, prices were more than 30% above the trend and in 17% of the years they were at least 30% below.

Table 2.1

Percentage Share of Years with Prices Above / Below the Average of the Preceding 11 Years

Above	1650-1719	1720-74	1775-1819	1820-45	1846-89
20%	26	16	13	19	11
30%	20	15	2	12	5
40%	16	4	2		5
50%	13	2			2
60%	10				2
70%	9				
80%	3				
90%	3				
Below					
20%	30	16	13	23	14
30%	17	9	7	15	2
40%	4		2	4	

All Swedish prices considered so far have been from Stockholm. How representative were they of the country as a whole? Were Stockholm prices more or less volatile than those in other areas? Table B.2 in the appendix B indicates that the prices in Stockholm County (B) had somewhat lower volatility values than the all-county median until sometime in the 19th century. After that point volatility was higher in Stockholm. During the 18th and early 19th century there were rather great differences in the price CV for different counties but these differences decrease from 1825 which is illustrated by the decreasing margin between the first and third quartiles. The counties with the highest price volatility in the 18th century were the ones with grain surpluses. The following chapters will address both the causes of volatility in grain prices and attempts made to deal with it.

Footnotes

[1] A simple model of this process has been constructed by Samuelson (1957).

[2] It is natural to suspect that these differing methods have affected calculated measures of price volatility. In order to address this concern, twenty-five years' (1725-1750) monthly price data for the two cities of Cologne and Nuremberg have been used calculating price volatility in several alternative ways. While the results are not identical, the differences are minor. Using only a single month at the end of the calendar year results in both the greatest volatility and the largest deviation from the other measures. If these results can be generalized, the implication is that the volatility values for Stockholm (calculated using end-of-year prices) are somewhat exaggerated relative to the values for those cities for which other methods were used.

Volatility 1725-50: Results from various Methods of calculations	CV		Mean deviation from trend		Median deviation from trend	
Cities:	Nur	Col	Nur	Col	Nur	Col
12 monthly data each year	29	26	23	20	21	17
Calendar Year: (Annual average of monthly data Jan-Dec)	27	23	22	19	21	18
Harvest year: (Annual average of monthly data Jul- Jun)	28	23	22	18	21	17
Prices in November/December each year	31	27	24	21	23	16

Source: Ebeling and Irrsiegler (1976) and Bauernfeind (1993)

[3] Unger web-site.

[4] Unger web-site; Ralph (1996).

[5] Possible reasons for the low volatility are briefly discussed in chapter 8.

CHAPTER III

Harvest variability

It is highly unlikely that the major year-to-year fluctuations in grain prices discussed in the previous chapter were the result of shifts in demand. Certainly, both population growth and changing income levels had a major impact on the level of demand. Still, these variables were long-term in nature and did not vary substantially on an annual basis. Supply, however, was subject to large short run shifts, principally because of variable harvests, but also sometimes as a result of warfare.

Grain was by far the most important foodstuff during the Early Modern Period[1]. The growth of population during the 17th century caused a shift in calorie consumption away from animal products towards grain. Potatoes, the new, low-cost, source of calories, did not become wide-spread in Sweden until the early decades of the 19th century. In addition to bread, grain was consumed as porridge, beer and *bränvin*, a form of distilled alcohol that came into general use in the 1680s. Consequently the state of the annual grain harvest had a crucial impact on living conditions.

Two quite different aspects of the harvest outcomes will be discussed here: their effect on individual households and on the aggregate level. In fact, most of the grain produced never reached the market. Not only the tithes, but also an important part of the taxes and rents were normally both denominated and paid in grain. In addition, substantial amounts were set aside for seed, animal feed and peasant household consumption. The harvest outcome for the individual household determined whether there was a surplus to sell or a need for supplementary purchases. The aggregate harvest volume within an integrated region where trade could take place is the second aspect studied. Indeed, the principal purpose of this chapter is to clarify the difference between the two concepts of volatility and how they interact, thereby demonstrating the potential power of the integration process.

Anyone who has searched for pre-20th century harvest data for Sweden (or any other country) will be painfully aware of the great difficulty of finding reliable quantitative results.[2] The problem is not a total lack of empirical evidence. In fact, information is abundant. It consists, however, of bits and pieces dealing with various areas, grain varieties and time periods, and with highly uneven levels of reliability. The challenge is to construct a comprehensive and balanced picture.

The sources seldom present a coherent structure. As with archaeology, it may be necessary to posit a hypothetical whole on the basis of a number of fragments, followed by an iterative, inter-active process of comparing this image of the whole with newly discovered details. New evidence will sometimes tend

to verify the image and sometimes require revisions.

The approach here is to begin with some general and theoretical considerations and then to utilize empirical evidence to construct a preliminary image of variations for the family farm and the overall supply.

The decisive role played by the weather on harvests, both in the short and in the long run, is obvious. As has been demonstrated by the path breaking research of Utterström, LeRoy Laudri and others, long-term climatic change has had important implications for historical development.[3] The short-term variations, that is "the weather", and their effect on harvests and living conditions attracted less scholarly attention. Utterström (1957b) and E L Jones, however, have studied the annual effects of weather on harvests during the 18th and 19th centuries for Sweden and England respectively[4]. The Swiss "weather historian" Christian Pfister and the Dutch agricultural historian Slicher van Bath are two scholars who have addressed the question of annual harvest fluctuations, both from a general and from a detailed perspective.

Pfister cites the conclusion of Georgelin that, in the Netherlands, 95% of yield variations were weather related with the remaining 5% being the result of soil exhaustion.[5] Such an assertion, however, does not solve the task of specifying the exact relationship between harvests and the weather, a problem further complicated by the serious lack of reliable data.

Seasonal differences in North Western Europe are less pronounced than in the interior of the continents. This, however, does not mean that the daily variations are smaller. Indeed, a typical feature of this region is that the weather is very changeable from day to day and differs even among areas that are close to one another. Weather conditions are usually dominated by the inter play among low-pressure areas moving from west to east along either the arctic or the polar front. More stable, high-pressure areas emanating from the russian interior or from Central Europe occasionally interrupt this pattern. As a result, the weather seldom remains stable for very long, with ever changing grain growing conditions. According to Pfister, the weather has three distinct effects on the harvest:

- The growth of plants is directly effected by sunshine, rain, temperature etc.
- Heavy rainfall can wash away nutrients (e.g. nitrogenous materials) from the soil.
- Certain weather conditions can be conducive to crop damage from plant diseases, insects, molds, etc.[6]

In North Western Europe, the first category of effects is the most important. The effect of weather on plant growth, however, is complex. It cannot be reduced to a single, or even a small number, of values such as the average temperature or amount of rainfall. The effects of sunlight, precipitation and temperature vary among stages in the total growth process. This is not a modern discovery. Pfister quotes an "economist" (i.e. an expert on the practical aspects of agriculture) of the Ancien Regime as follows: " To grow, winter grains require dry weather during the preparation of the soil prior to sowing, mild and humid conditions for sprouting, a dry winter with snow cover for 10-12 weeks, mild and dry weather in the spring, cool for slow growth and not too dry, but warm, for maturation, and then dry and sunny conditions for the harvest" [7].

Pfister constructed a model incorporating seven independent variables that

take on values ranging from -5 to +5. These variables are autumn rainfall, autumn temperatures, winter precipitation, spring rainfall, spring temperatures, summer temperatures and summer rainfall.[8]

Slicher van Bath has identified eight phases in grain agriculture, starting with ploughing and planting in early autumn followed by growth during the spring and, finally, ripening and harvesting in August. In each of these phases sunlight, precipitation and temperatures all played crucial roles, positive or negative.[9]

Slicher van Bath also noted that yields were much more sensitive to precipitation than to temperatures, although in western and northern Europe low temperatures and a lack of sunshine also could be damaging. Pfister suggested that small deviations from normal weather were of little consequence. They had to pass certain threshold values to be significant. Once that was the case, however, the results might be dramatic. In northern Europe, where the summer is short but the days are long, the more intensive growing season was especially sensitive to disturbances.

Variations in soil conditions also affected the threshold values. It is clear that yields fluctuated least on loess, while light clay cultivation was somewhat riskier. Heavy clay or sandy soils were particularly sensitive to the weather. When there was a diversity of soils within a given area, identical weather could result in drastically different yields.

Slicher van Bath noted that pre-nineteenth century grain yields were much more sensitive to weather conditions than is the case today. Improved seed quality, chemical fertilizers, phyto-pathological research, herbicides, improved equipment and increasingly sophisticated crop rotations all have contributed to more stable yields.

Palm (1997) studied data from a farm in Halland during more than 100 years to trace impact of weather on the yield ratios. He found obvious influences from weather but they varied greatly between different types of grain. Weather conditions during a number of different periods, even prior to sowing, had an impact on the yields. The relationship thus appeared to be extremely complicated.

Taken together these various observations make one thing abundantly clear. Any model that can successfully explain the relationship between the weather and harvests would have to be extremely complex. Moreover, if such a model was to be constructed, a lack of detailed meteorological data would prevent its explanatory variables from being quantified. No calculation is needed to realize that the chance of two identical outcomes is extremely small. Obviously, the correlation between the outcomes in two different locations will never be precisely equal to one. This absence of perfect correlation is important for an understanding of the fluctuations in aggregate values. It is common sense to realize that when two things evolve differently, there will be a tendency for their idiosyncrasies to offset each other.

According to any text book on finance, the variance of a portfolio containing two variables X and Y will decrease as the co-variation between the original series decreases. Only if the two are perfectly correlated will the volatility of the aggregated series equal that of its components.[10] As the number of variables increases, the impact of each individual variance will decrease. At the same time, the impact of the covariance increases, and as the number of variables approaches

infinity, it becomes crucial. At that point it is the average of all the pair-wise co-variances that matters[11].

As the number of units of observation (parcels of land, farms or parishes) increases, a larger and larger geographic area will be involved. Moreover, as the area increases, the average distance between the units of observation necessarily increases, as does the probable variation in both weather and soil conditions. The average co-variation will thus decrease. This, in turn, implies that integration, where correlation decreases, becomes as important as the volatility of individual variables for the over-all volatility in a given region.

Is this a testable hypothesis, and if so, what are the likely magnitudes? Even in the absence of complete information, it is possible to gain an improved understanding of the volatility of grain production by utilizing this approach. The first step will be to critically discuss the available historical sources on harvest outcomes. A stylized scheme of harvest outcomes will then be constructed as an approximation to be used in the absence of true quantitative data.

Historical Sources

There are five different types of historical information on Swedish harvest outcomes:

1. Estate accounts
2. Tithe rolls
3. Reports submitted to the Government Statistical Office (*Tabellverket*)
4. Official harvest estimates
5. Qualitative data (e.g. the correspondence between regional officials and the central government).

Only a small number of the preserved estate accounts were sufficiently well kept to generate a long-term series of harvest results. Moreover, those that are of such high quality are almost exclusively from the large estates of the nobility or the Crown. I have not been able to work with the sources but will here rely on data prepared by other authors like Heckscher, Utterström, Leijonhufvud and Olsson[12]. In addition, Professor Wallerius of Uppsala University published a report containing the yields of rye and barley on his farm outside Uppsala for a long period during the 18th century. [13]

The Crown tithe rolls were compiled for fiscal reasons. When such accounts are available – as they often are – it is possible to follow annual harvest outcomes for a bailiwick, a parish or even an individual farm, until the tithes were permanently fixed in amount. This conversion occurred on a parish-by-parish basis during the late 17th century and more commonly in eastern Sweden in the 18th century. The reliability of the harvest information contained in the tithe rolls has been the subject of considerable scholarly debate in Sweden ever since they were first utilized by Forsell in the 1880s. The current consensus is that the tithes substantially underestimate the absolute harvest levels because they exclude

various producers.[14] My personal experience of working with these rolls has led me to conclude the following: the tithe rolls are a valuable source and it would be a mistake to totally disregard them as being unreliable. Their contents, however, cannot be accepted uncritically. The absolute levels are certainly unreliable, and they become more so the greater the level of aggregation. It is also clear that changing assessment procedures and other institutional changes occasionally affected the recorded values. As a result, the rolls cannot uncritically be relied on as indicators of long-term production trends. With regard to annual fluctuations at the parish or household level, however, the problems seem to be less severe. Nonetheless, this data must always be utilized with great care, especially since it was produced for tax purposes, not to facilitate research in economic history. (For further discussion, see appendix C).

The basis for accurate Swedish population statistics was laid in 1749. From then on, every pastor was required by the Crown to submit information detailing the year's demographic events in his parish. He sent a filled-in form to the dean responsible for a number of parishes, who would then summarize the results for his jurisdiction and submit it to the Government Statistical Office (*Tabellkommissionen*). The latter then produced nation-wide summary calculations. These results were not intended for publication, being viewed as of military importance. During the period between 1802 and 1820, the form asked for estimates of the amount of grain used for seed and the average yield ratios (*korntal*) for all types of grain and for potatoes in the parish. All this data is now stored in the Church Department of the Regional Archives (*landsarkiv*). They are a remarkable source of detailed information. Once again, however, their reliability has been questioned. The problem is that some members of the clergy campaigned against their reporting duties.[15] While the material is certainly deficient in many respects, I have been astonished by the logical consistency displayed by the material. While it cannot be considered useful for estimating absolute quantities, it is probably at least as reliable as the tithe rolls for annual changes. After 1820 collecting this data was transferred to the county governors. It also was limited to five-year periods, thus depriving scholars of the ability to study annual fluctuations.

The first general assessment of harvest outcomes, covering the period 1523–1781, was published in 1783 by Emanuel Ekman, professor of economics at Uppsala University. Ekman's work was based on a theory presented in *Essai sur la Police des Grains* of *la Societé Economique de Berne*. It argued that within each decade there was a largely constant number of poor, medium and abundant harvests.[16] For his sources, Ekman relied on the calls for national days of prayers in the face of poor harvests issued by the Archbishop of Sweden (*bönedagsplakat*). Starting in 1683 he also utilized the market scale prices for Uppsala County. A close look at these sources leaves the distinct impression that Ekman adjusted his interpretations of the harvest outcomes to make them fit his theory. Thus it is hardly surprising that the value and reliability of Ekman's series has been seriously questioned.[17] The Government Statistical Office, however, used Ekman's series in a report in 1802 which gave the estimations a kind of official authorization and they also continued the series after 1781 until 1802 and it has been assumed that the

reported results for those years are a combination of harvest estimates based on qualitative comments from the deans and pastors and on price data. Since 1802, however, the values seem strictly to reflect quantitative harvest results, although with the reservations previously made about this statistics.[18] Each of these two changes resulted in an improvement in the accuracy of the series making it more reliable, at least in terms of the direction of fluctuations. The Historical Statistics published in 1959 by Statistics Sweden includes this general harvest index. On the advice of Professor Söderlund, however, the pre-1786 data was omitted.[19]

Qualitative data from written sources, consisting of official letters from the county governors to the king, the Diet or national government agencies such as the Public Lands and Funds Office (*Kammarkollegium*) or the Treasury Office (*Statskontoret*) and including commentary on harvest outcomes, are abundantly available. Unfortunately, it is neither systematic nor continuous. It is difficult to compare the information contained in various letters since the authors had differing attitudes and perspectives. Furthermore, the documents might be contemporary, but they are certainly not impartial. The authors invariably had some political or administrative motive. These sources have been the subject of three reasonably systematic studies of which I am aware. These are by Axelson[20] for the period 1695-1718, by Imhoff[21] for the period 1720-50 and by Utterström[22] for the period 1721-1860. While it is obviously difficult to base an analysis on this type of correspondence, it can be useful in confirming other data and in adding details to particular episodes. For Scania Weibull (1923) made a similar inventory of qualitative statements which Olsson (2005) used to verify the variations in tithe accounts that he studied.[23] The difficulty of transforming this qualitative information into a form useful for quantitative analysis is well demonstrated by the work of Jörberg.[24] As he himself admitted, the results were far from convincing.

Empirical Evidence

The preceding discussion makes it clear that any analysis of harvest fluctuations must be very precise with regard to the level of aggregation of the data.

Open Fields

During the Early Modern Period farming was largely done on unenclosed land in what is referred to as the open field system. The first step towards the re-allocation, or enclosure, of land in Sweden, the so-called *storskifte*, was undertaken in the middle of the 18th century. This was followed by a number of further initiatives during the next hundred years. In many cases, however, actual implementation of the enclosures did occur until the second half of the 19th century. Until then, most farming continued to be done on unenclosed plots. Under this system, even in its simplest form, each peasant had a plot in numerous, but at the very least three, common fields. Variations in microclimates and soil conditions even within one field are often sufficient to prevent perfect correlation of yields, even for the

same crop. Thus, summing such series yields a lower total volatility compared to that of each individual series. This has been emphasized by D McCloskey in a number of articles attempting to establish a rational basis for the opposition to enclosure displayed by the peasantry. While in a number of ways impractical, the distribution of a single household's plots over a wide area did provide some insurance in case of substantial and highly localized crop variability (e.g. because of insect infestation, crop disease, hail storms or animal depredation). The data available on crop yields for individual unenclosed plots are generally from the land surveys undertaken in connection with enclosures. As such, they invariably report multi-year averages, not annual fluctuations.

Estates and Farms

The studies by Heckscher, Utterström, Palm, Leijonhufvud and Olsson, mentioned above are all based on the account books of manors located in various parts of the country and covering various time periods. A summary of their results is presented in table 3.1.

Table 3.1
Variation of Yield Ratios for Various Estates and Time Periods

	Source	Period	CV Rye	CV Barley
Ottenby	1	1550 - 1562	34.1	46.1
Perstorp	1	1573 - 1580	27	43.8
Höjentorp	1	1575 - 1588	28.1	37.6
Kungs-Norrby	1	1580 - 1602	62.7	33.1
Vadstena	1	1580 - 1602	57.2	28.3
Hov	1	1580 - 1606	41.9	28.9
Ottenby	1	1581 - 1619	34.8	39.5
Höjentorp	1	1599 - 1605	73.8	28.9
Vittskövle	2	1599 - 1699	49	49
Läckö	1	1625 - 1640	42.1	35
Vittskövle	2	1700 - 1799	63	36
Skarhult	3	1724 - 1771	72.4	
Rydboholm	3	1731 - 1769	42.3	
Wallerius	4	1748 - 1777	29	29.8
Djäknebol	8	1761 - 1861	31.7	33.8
Fållnäs	5	1796 - 1863	25.4	31.2
Vittskövle	2	1800 - 1849	27	33
Björnö	6	1803 - 1842	31.4	37.7
Bysta	6	1816 - 1860	41	70.3
Nynäs	7	1821 - 1879	29.5	33.5
Median			41	33.8
1st Quartile			30.5	31.2
3rd Quartile			53.1	37.7

Sources: (1) Leijonhufvud, (2) Olsson, (3) Heckscher, (4) Wallerius (5) Fållnäs Private Estate Archive, (6) Utterström, (7) Gasslander, (8) Palm.

Note: The high volatility values of Vittskövle and Skarhult for rye during the 18th century may at least partly be explained by the use of the so called *larsmässo* rye (the name referring to the Lars day 10 August when sowing began). This type of seed was generally considered to give higher but more variable yields. [25]

The coefficients of variations for the yield ratios are generally high and there are also great differences between various observations at least as regards rye. For a discussion of problems raised by some of these data, see the appendix A. Both Wallerius and Björnö report VC's for barley that are slightly higher than those for rye. In the case of Bysta, the extremely high value for barley raises concern.

Four of the estates listed above in table 3.1 experienced a substantial common time period for which overlapping data permits their correlation coefficients to be calculated. Three of these estates are located close to the Baltic Sea: Björnö in the vicinity of Norrtälje approximately 50 kilometres north of Stockholm, Fållnäs at the coast 40 kilometres south of Stockholm and Nynäs near the coast and further 25 kilometres south. Bysta, however, is further inland, approximately 200 kilometres south west of Stockholm, near the city of Örebro. A correlation matrix for these estates is contained in table 3.2. The only fairly strong correlation is that for rye among the three coastal estates. The virtual absence of co-variation for barley is striking.

Table 3.2
Correlation Coefficients for Four Estates in Eastern Sweden

1821–1842			
Rye	Fållnäs	Björnö	Bysta
Nynäs	0.55	0.54	0.32
Fållnäs		0.65	0.22
Björnö			0.45
Barley			
Nynäs	-0.09	0.20	0.24
Fållnäs		0.42	-0.08
Björnö			-0.10

Sources: See table 3.2

As long as the quantity of seed is kept constant, yield ratios and harvest outcomes measure the same thing. The material I have collected for further studies includes data on individual farms taken from the tithe rolls of Munktorp parish in the province of Västmanland covering the years 1750-64. For the eleven-year period 1750–60, there were 148 farms for which there was at most one year missing. Harvest volatility, measured as the coefficient of variation, differed among the various farms. The distribution of various levels is displayed in figure 3.1. More than two thirds of all the farms had a CV between 30 and 50, while only approximately 15% were either above or below that range. In the case of rye, there is marked concentration of results between 40 and 50 and barley between 30 and 40 and the same for the total harvest (rye + barley).

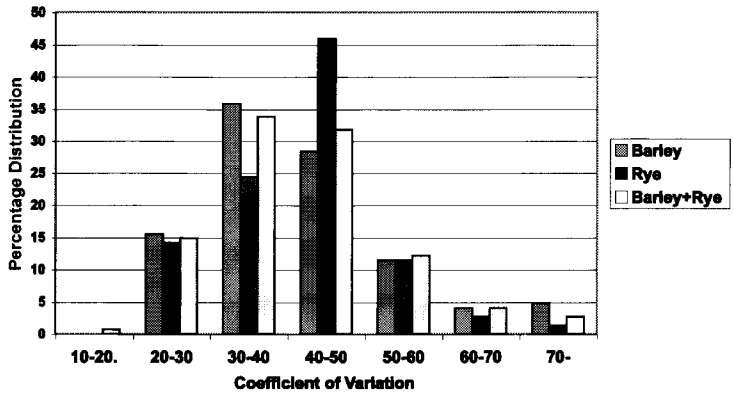


Figure 3.1
Fluctuations of Harvests 1750-60 in 148 farms in Munktorp
Distribution according to coefficient of variation. The presentation is based on excepts from the tithe rolls for identified farms with continuous data with no more than one missing year.
Source: Länsräkenskaperna, Västmanlands län, RA.

One factor of great importance for the volatility of the total harvest at the farm level was the correlation between the various kinds of grain primarily between (winter) rye and (spring) barley. The median value of the correlation between the yields of rye and of barley was 0.51, but, as demonstrated in figure 3.2, it varied greatly among farms.

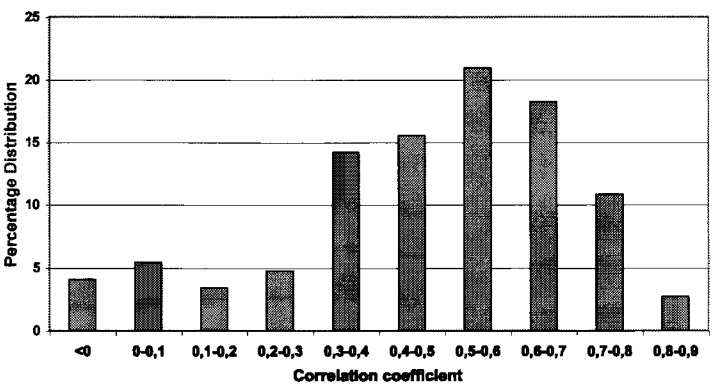


Figure 3.2
Correlation Between Rye and Barley on 92 Farms in Munktorp.
Note. Only farms with no missing values are included.
Source: Länsräkenskaperna, Västmanlands län, RA.

The correlation between the various farms in the parish had an important impact on the harvest volatility at the parish level. The pair wise correlation was measured for 92 farms. Half of these farms had an average value of their coefficients of correlation with all the other farms of 0.7–0.8, while an additional 35% had an average value of 0.6–0.7. Only one farm had an average value above 0.8, and less than 15% had an average value below 0.6.

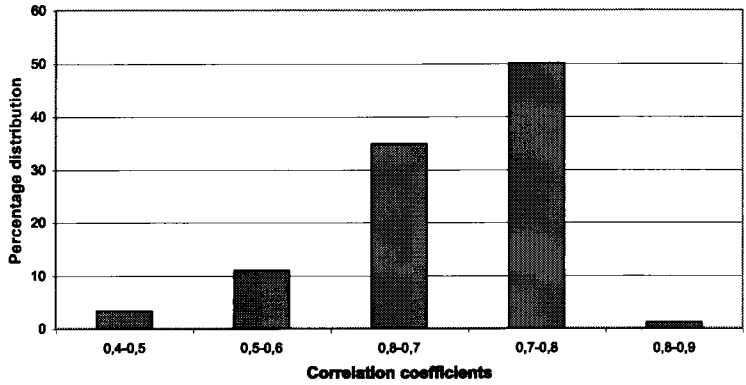


Figure 3.3
Correlations Among Farms.
The series of harvests values of rye and barley aggregated for each of the 92 farms were cross correlated and the average values of the pair-wise correlations calculated.

Comparing the median of the coefficient of variation for all farms with the parish aggregate, which is done in table 3.3, clearly demonstrates the importance of the integration effect. The CV:s for the harvests at the parish level are about 10 units lower than the median values at the farm level.

Table 3.3
Coefficients of Variation for Aggregate Parish Values and for Median Values of Individual Farms in Munktorp, 1750-1760.

	Rye	Barley	Total harvest
Median value of individual farms	42.4	39.5	40.6
Aggregated values for the whole parish	34.8	26.8	29.9

Sources: Länsräkenskaperna, Västmanland, Verifikationer, RA.

While the typical coefficients of variation of yield ratios for the estates in table 3.1 were approximately 30 ± 10, those for the individual farms in Munktorp were somewhat higher, around 40 ± 10. This should not come as a surprise. In addition to utilizing somewhat more advanced production techniques, the larger size of the estates provided better opportunities to reduce risk through simple aggregation. The evidence for this high volatility at the farm level, however, is not totally unambiguous. Olsson (2005) has recently published some series based on the tithes that were given to the pastor of two parishes in south-western Scania, which display significantly lower fluctuation values for both individual farms and for the parishes. See appendix C.

The Parish Level

For a number of parishes continuous tithe roll excerpts are available and they have been used here to study the volatility at the parish level. The variation coefficients contained in table 3.4 are based on the following data:

1. The tithe accounts of 18 parishes contained in an appendix to Hegardt (1975) for the period 1655-1719.
2. Additional tithe data I have collected for the same parishes for the years following 1719 until the tithe became a fixed amount.
3. Tithe data from the parish of By contained in Isacson (1979).
4. The table also contains CV for the yield ratios 1802-20 when data is available from the Government Statistical Office (*Tabellverket*).

Table 3.4
Coefficients of Harvest Fluctuations in Selected Parishes

	Tithe Values			GSO
	1655-89	1690-1725	1726-58	1802-20
Torpa	29	23	27	21
Munktorp	32	26	27	34
Björkskog	29	27	31	23
Börje	22	42	40	32
Uppsala-Näs	27	41	40	24
Harbo	28	24	16	
Husby-Odensala	28	36		38
Närtuna	23	40		23
Husby-Långhundra	28	42		22
Odensala	35	38		35
Skepptuna	32	44		39
Alfta	28	28		
Järvsö	26	29		
Segerstad	23	30		
Delsbo	20	32		
Ovanåker	20	30		
Bollnäs	24	25		
Hanebo	24	26		
By	29	27	25	
Median	28	30	27	28

Sources: Hegardt (1975), Avkortningsböcker UA, Isacsson (1979). For the GSO values: CA of the parishes. Ula.

Except the three Västmanland parishes (Torpa, Munktorp and Björkskog) and Harbo, the second time period displays an increase in volatility. That result, of course, is to be expected since there were major crop failures in the late 1690s, 1709 and 1719.

Given all the criticism that has been hurled at the values presented by the Government Statistical Office (*Tabellverket*), it is perhaps surprising that the implications of its data are quite similar to those from the tithe rolls. If neither were reliable, the reasonable expectation would be for them to differ. Instead, both the harvest quantities from the tithe rolls and the yield ratio results from the Government Statistical Office point to a typical value close to 30 for the coefficients of variation.[26]

The variation at the next level, at the county or regional level, is to an important extent determined by the correlation between the parishes. When the distance between the parishes increases so does the probability that differences in weather, soil conditions etc also grow. It is thus of interest to study the relationship between distance and correlations. Table 3.5 is based on Hegardt's parish tithe data for the period 1655–1719. The parishes are pair-wisely correlated with each other and the results grouped according to the geographic distance between their churches. The resulting mean values of the correlation coefficients in each group are presented in the table 3.5.

Table 3. 5
Distances Between, and Correlations Among, Parishes.

Distance in km between Parish Churches	Average Correlation Coefficient
0-5	0.87
10-15	0.76
15-20	0.71
20-40	0.62
40-80	0.51

Source: See Table 3.4

These results can be compared to the correlations between the manors in Östergötland (Vadstena and Hov) reported by Leijonhufvud. These two manors are located about ten kilometres apart. Their rye yields have a correlation of 0.69 while that for barley is 0.61. These results seem reasonably similar to the parish values reported in table 3.5 where, however, the correlation refers to total grain production. The results for rye in table 3.2 are also roughly in line with this, which however is not the case with barley. But on the whole these various observations tend to confirm the hypothesis that the correlation decreases with distance, thus making the average correlation smaller the larger the area studied.

Volatility at the County Level

As implied by the previous discussion, the county level coefficients of variation are significantly smaller than those at the parish level. Being much larger in area, the county includes many more observations with lower average correlations, thus resulting in a lower coefficient of variation. When moving focus from the farm level to the parish level we can thus distinguish a reduction from the region of 40 to 30 in the coefficients of variation and when moving to the county level there is another decrease by ten per cent. There may be reasons to suspect that the variability of the GSO values can be underestimated if there was reckless mechanical reporting from some pastors which some critics argued.

Table 3.6

Coefficients of Variation of Yield Ratios in Various Counties, 1802-1820

	Coefficient of variation	
County code	Rye	Barley
B	14	24
C	22	23
D	14	23
E	13	14
F	14	21
G	28	20
H	15	10
I	21	14
K	23	20
L	18	11
M	26	10
N	14	12
O	18	12
P	17	19
R	14	10
S	15	12
T	18	14
U	20	22
W	16	18
X	20	15
Y	15	18
Median	17	16

Source: Tabellkommisionen, RA

The yield ratio series 1802–20 for the various counties have been cross-correlated and grouped according to similar mutual correlation coefficients. This procedure yields clusters based on the closeness of the counties' harvest variability.

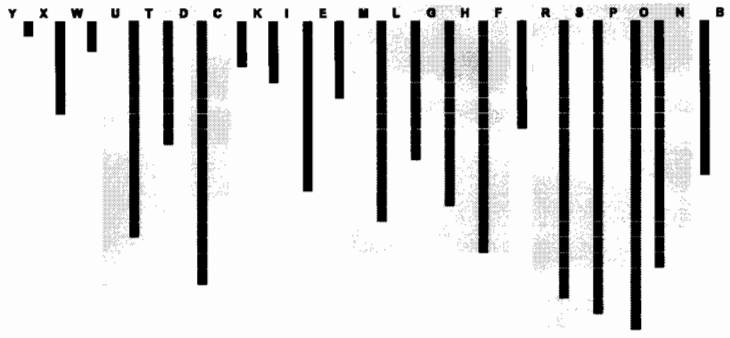


Figure 3.4

Correlation Clusters: County Level - Rye, 1802-20.

Note. The figure displays three major clusters (shadowed). Reading from left to right, the first major cluster is located in the mid eastern region of Sweden, including Västmanland (U), Örebro (T), Södermanland (D) and Uppsala (C) counties. The second, or southern, cluster consists of Malmöhus (M), Kristianstad (L), Kronoberg (G), Kalmar (H) and Jönköping (F). Finally, there is a major western grouping involving Skaraborg (R), Värmland (S), Älvsborg (P), Bohus (O) and Halland (N). One could perhaps also distinguish two minor clusters, one consisting of Gävleborg (X) and Kopparberg (W) and another consisting of Gotland (I) and Östergötland (E) respectively.

Source: See table 3.6

Although these results must be viewed with caution, meteorologically they make sense since the counties clustered together are also geographically adjacent.[27] The median value of the correlations among all the counties is 0.42. Within the mideastern, southern and western clustered regions it is 0.65, 0.63 and 0.85 respectively.

The National Level

Starting in 1865, there exists a continuous series of annual harvest outcomes at the national level. These yield the following values where the CV for the total grain harvest at the National level is 10.

Table 3.7
Coefficient of Variation for Harvests at the National Level

1865-1910	CV
Wheat	12.0
Rye	9.5
Barley	11.2
Oats	13.4
All grains	10.1
Potatoes	18.0

Source: SCB (1959)

All these empirical results tend to confirm the hypothesis that the correlation among variables was crucial for the variance of the total harvest. In most years, this meant that the variance at a highly aggregated level was significantly lower than that for smaller production units. Exceptions, however, occurred. There were some years when highly abnormal weather conditions uniformly affected large areas, resulting in an unusually high correlation. Two examples were the occurrence either of extremely long and cold winters or very dry summers all over northern Europe. Such events could have extremely serious consequences. The year 1771 is a typical such example. Even if the outcome on the individual units were no worse than for other bad years, the universal occurrence of poor results would result in an unusually small total harvest. That was probably the most common explanation for the occasional truly disastrous crop failures.

Autocorrelation

An analysis of the tithe roll data yields no *general* signs of autocorrelation. Little, if any, autocorrelation can be detected for rye, although occasionally there is some for barley. Some parishes have fairly large values, while others have none at all. In Munktorp some peasant households, but far from all, display strong autocorrelation for barley. As for the two kinds of grain, the difference between

them makes sense. Rye was sown in the late summer or early fall, preferably with seed from the previous year's crop, while barley was sown in the spring with seed harvested six months previously. The amount of seed available might then be affected by the outcome of the previous harvest, which, in turn, would affect the outcome of the next harvest. The available data, however, does not permit this hypothesis to be tested.

A Summary of Harvest Variations and Levels of Aggregation

The type of source material presented in this chapter is not well suited to quantitative summarizing. It seems more natural to treat it as qualitative in nature and to interpret it as such. Such interpretations, however, are never definitive. They must always be subjected to reassessment whenever new and contradictory empirical evidence is discovered. In the following table the previous observations are interpreted and summarized as stylized facts.

Ingoing units	Correlation	Aggregated unit
CV of each plot and each grain 45 %	0.8 between various plots	CV of each grain from the various plots 43 %
CV of each grain from the various plots 45 %	0.5 between various types of grain	CV for total grain harvest of the farm, 37%
CV for total grain harvest of the farms, 37 %	0.55 between various farms in the parish	CV for total grain harvest in the parish 30 %
CV for total grain harvest in the parish 30 %	0.45 between various parishes in the County	CV of total grain harvest in the County 20 %
CV of total grain harvest in the County 20 %	0.4 between various counties in the Country	CV for total harvest on the national level 13%

Figure 3.6

Implications of Various Levels of Correlation for Volatility – Stylized Facts

The results in this table reinforce the importance of relating data on harvest variations to the level of aggregation of the comparison. Data from one level cannot meaningfully be used as a proxy for the magnitude of variations at another level. It also demonstrates the great potential for reducing aggregate volatility through wider geographic integration. Technical advances in agriculture in the 19th century resulted in reduced harvest variability, which certainly benefited the individual peasant. Their role in reducing the volatility of total supply, however, was less important than that of increased geographic market integration. Even very high volatility at the individual plot level does not necessarily result in high volatility at the national level. Utilizing the

potential benefits of geographic integration at the county and national levels could result in major benefits. While the scattering of plots under the open field system provided some positive effect, it was not an important source of reduced volatility. The true challenge was to take advantage of the potential benefits offered by the diversity in local harvest outcomes. It was therefore crucial that an efficient system for the geographic movement of grain be developed. As will be discussed below such reallocation could take various forms, either through government coercion or free markets.

Footnotes

[1] See Morell (1989) for a survey.
[2] According to Morell & Whitaker (1992) there was no reliable production statistics until the 1920s.
[3] Utterström (1955); Le Roy Laudri (1983).
[4] Utterström (1957b); Jones (1964).
[5] Pfister (1985) p.34.
[6] Pfister (1985) p.34.
[7] Pfister (1985) p.33 "Das Wintergetreide erfordert zu seinem Gedeihen trokenes Weter zur Bestellung des Akers zur Saat, mildes und feuchtes zur Aufkeimen, eine trokene Winterzeit und Schnee zur Bedekung 10-12 Wochen durch: mildes und trokenes Weter im Frühjahr, kühles zum langsamen Wachstum, nicht zu trokenes, aber warmes zur Zeitingung, trokenes und schönes zur Ernde".
[8] Pfister (1988).
[9] Slicher van Bath (1977) p.57.
[10] The variance for a portfolio with two assets, a % of X and b % of Y *is:*
$a^2 s_x^2 + b^2 s_y^2 + 2ab\ r_{xy}\ s_x s_y$
where r_{xy} is the correlation between X and Y, and where s_x and s_y are the standard deviations of X and Y respectively. Ross, Westerfield and Jaffe (2002) p.251
[11] Ibd p.262. It is then possible to calculate the variance $Var = \overline{Cov}$, where $\overline{Cov}$ is the average of the co-variations between the variables
[12] Heckscher (1949); Gasslander (1949); Utterström (1957a); Leijonhufvud (2001); Olsson (2002); Palm (1997). In one case, the Fållnäs Estate, I have excerpted harvest data from their private Estate Archive.
[13] Wallerius (1779).
[14] In appendix C there is a short summary of various forms of criticism that have been raised.
[15] Gadd (1999). Since most pastors had an extensive agricultural activity, there is no reason to question their competence but the position may still have been ambiguous since the income of the pastors generally was based on a variable third of the tithe.
[16] Ekman (1782).
[17] Brolin (1954).
[18] Brolin (1954).
[19] SCB (1959) p.32.
[20] Axelsson (1888).
[21] Imhoff (1976).
[22] Utterström (1957 b). p.429-43.
[23] Olsson (2005) p.72-73 and p.122.
[24] Jörberg (1972 b) p.69-72.
[25] Olsson (2002) p.239-40.
[26] Also here the values from the two Scania parishes reported by (Olsson 2005) deviate. For the two parishes the CV is only half or 16,8 and 13,2 % respectively. See Appendix C.
[27] The rather strong closeness between Halland (N) and Stockholm (B) counties does, however, not make any sense.

CHAPTER IV

Price Formation and Market Integration

Traditional Theory

That there was a link between harvests and prices can be taken for granted. But how direct was this link? Precisely how were prices determined once the outcome of the harvest became known?

In the 17th century Gregory King invented what he called "political aritmetik" but we call econometrics. In doing so he provided Charles Davenant with calculations of how much prices would rise if the "shortfall of harvest is one, two, three, four and five tenths", thus estimating the world's first empirical demand curve. This exercise was later cited by Stanley Jevons in his "Theory of Political Economy", the very book in which he laid the foundation for neo-classical price theory. Ever since, scholars who combine an interest in doctrinal history with a mathematical bent have been inspired to convert that first curve into an algebraic expression.[1] Although their suggestions vary somewhat, they all agree that King's series implies a function whose elasticity is approximately -0.4 in the vicinity of average harvest levels.

Traditionally grain has served as the textbook example of a commodity with a low price elasticity of demand. The widespread assumption of a direct relationship between harvest outcomes and grain prices is exemplified by Hoskins' classic articles on price and harvest fluctuations in England. He simply took for granted that harvest fluctuations could be inferred from the available price data alone.[2]

Thus the traditional textbook model is based on a demand schedule with a low price elasticity. Such an assumption is reasonable since food is a necessity and there were no cheaper substitutes for grain. Those who lacked sufficient grain to feed themselves and their families had no choice but to buy it, regardless of price. Such a situation implies a very low elasticity demand curve. Only the eventual lack of money will force hungry buyers to reduce their purchases. In time, the introduction and spread of the potato as an inexpensive alternative foodstuff had a cross elasticity effect that increased the price elasticity of grain. In Sweden, however, that development did not occur until early in the 19th century.

There is good reason to believe that, in the short-run, the demand curve for grain was generally stable. Exceptions were possible, however. Thus Bauernfeind has argued that there could be negative demand shocks in large cities when epidemics struck and thousands died suddenly. Of course, in the long-run the demand curve shifted in response to external forces such as population growth and income fluctuations.[3]

As to supply, in the short-run it was even more inelastic than demand. Once the fields had been sown, the crop was at the mercy of the weather, and supply simply reflected the volume harvested. Year-to year storage might have increased supply elasticity somewhat, but there is very little historical evidence of such activity. Most peasants lacked the liquidity required to invest in grain inventories. As demonstrated in the previous chapter, harvest variations, or shocks, that shifted the supply curve to the left or to the right, were annual events. Even a relatively small leftward shift in the supply curve – e.g. from S_2 to S_1 in figure 4.1 – was enough to move the intersection of supply with the steep demand curve up substantially. The result, of course, was a major price increase from P_2 to P_1.[4] This is the traditional neo-classical model, illustrated below, where the three different year-specific supply curves vary only modestly but result in proportionately much larger price differences.

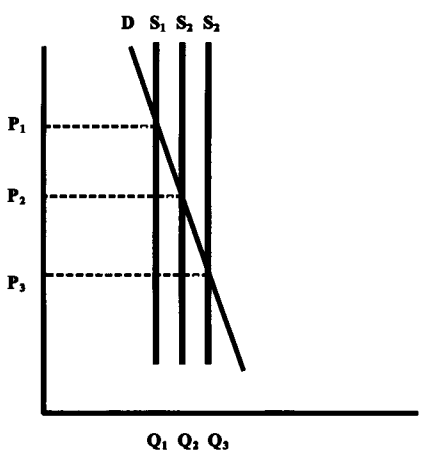


Figure 4.1
Demand and Three Alternative Supply Functions

The simplicity and logical appeal of this model have caused many scholars to engage in wishful thinking. Their hopeful acceptance of the model as an accurate description of reality, however, has inevitably lead to disappointment.

During the 1970s two Swedish economic historians, Lennart Jörberg and Astrid Hegardt,[5] had this experience. After a deeper examination and utilizing a more systematic and empirical approach, Jörberg concluded that "the uncomplicated conception of a strong correlation between price and estimated yields is not borne out by a closer analysis"[6] and that "One cannot automatically assume that a fall in prices was caused by an improvement in

the harvest in relation to the previous year or that a rise in prices can automatically be interpreted in terms of a deterioration in the harvest. In order to draw correct conclusions, it is necessary to analyse carefully price movements in both the individual and surrounding regions."[7] One explanation offered by Jörberg was a convergence of price movements since he reported a high correlation between Swedish grain prices and those in Denmark and Holland. "Consequently it is not out of question that international prices exerted a distinct influence on Swedish price movements as early as the 18th century. Grain imports – at the most 15 percent of consumption – might have had some influence as a price leader. At the same time it is clear that the outcome of the harvests in northern and western Europe was, to a certain extent, uniform, this influencing the price movements in the same direction."[8] As for Hegardt, she did not find the generally assumed direct link between harvests and prices. Indeed, she found convincing reasons for why it should not be expected. In particular, she stressed the importance of storage in breaking the direct connection between harvests and prices.[9] In critically commenting on her work, Lindgren, however, noted that imports were an additional factor that she should have considered.[10]

These results by Jörberg and Hegart have obviously contributed to undermining the pre-existing belief that the harvests were the "self-evident explanation" of grain price movements. They did not, however, offer any clear alternative explanation. Thus, the principal effect of their work has been to create continuing uncertainty and confusion concerning the link between harvest outcomes and grain prices. Jörberg concluded in 1972: "It remains to continue the investigations of the 18th century agrarian problems but with new methods and along other lines than those used up to now."[11] Unfortunately, such investigations have not yet been undertaken. That failure may well be the reason that Gadd (2000) in his History of Swedish Agriculture from 1720 to 1870 makes no reference to fluctuations in grain prices.

Leijonhufvud's work (2002) principally focused on the tithe records, but she also tested her results against a price series. This test "resulted in not particularly high correlation coefficient, although at least with the expected negative sign".[12] According to Leijonhufvud the best explanation for this weak correlation is that most of the grain reported in the tithe accounts never reached market.

Stronger results were obtained by Ernst Engel in his ambitious 1861 study of rye prices in Prussia between 1847 and 1861. Testing his numerical results yields the relatively good r-value of 0.70. In addition, the CV of 32 for prices and 19 for harvests are reasonable in the light of corresponding values discussed in chapters 2 and 3. Engel's data also can be used to estimate an equation that yields a price elasticity of -0.6 in the vicinity of the mean harvest. Being a good Prussian bureaucrat, Engel used his results to argue that social conditions in Kingdom of Prussia were much less harsh than those in Gregory King's Britain.[13]

The question thus remains as to why there is such a lack of empirical evidence of a strong negative correlation between harvest outcomes and grain prices in Sweden. Could the traditional neo-classical model in the presented form be unrealistic and, if it is, how might it be modified?

A "Modified" Neo-Classical Model

One possible explanation for the poor performance of the traditional model might lie in its implicit assumption of a closed economy. This aspect of the model has too often been rather cavalierly treated. Thus, for example, it has been dismissed simply because in the 18th century Swedish grain imports were only a small portion of total supply. This assertion is true, but it is also irrelevant. Even small import quantities can be important. According to economic theory, prices are determined by the cost of the marginal, not the average, quantities supplied, and the marginal source of supply was imports. The availability of imports, even if it was only potential, inevitably had a crucial impact on the domestic market. Thus, it seems reasonable to hypothesize that a modified model including foreign trade can better explain price formation than can the traditional, closed economy, model.

More than fifty years ago, while discussing grain price formation in Denmark, the Danish historian Gunnar Olsen pointed out that: "Grain prices were essentially determined by prices on the Dutch market. These prices were determined by supply in the Baltic provinces and demand from southern Europe. Danish exports, compared with those from east Prussia, Poland and Livonia, were so limited that they had little ability to influence Dutch prices in one direction or the other. Export prices determined those in the domestic market. These could, however, to some degree be affected by government activity.".[14] Persson (1999) followed the same path in outlining an idea that clearly was inspired by the venerable gold point theorem. He assumes a "single market small enough not to influence world market price. The higher the transport cost to the world market from that single market, the more prices would vary in that market before it would become worthwhile to trade. The export and import points of the single market define the limits of the local price volatility. There is a local minimum price, which would motivate export to the world market, and that minimum price is the world market price minus transport costs. If prices fall below that level the exporters in the local market will bid up the prices. Likewise, there is a maximum price in the single market, which will attract imports from the world market, and that, is the world market price plus transport cost."[15] I believe that this Persson/Olsen idea is worth pursuing and incorporating in the traditional neo-classical model.

Figure 4.2 has the traditional inelastic demand curve together with a perfectly inelastic domestic supply curve s (d). In addition, however, there is a horizontal dotted line representing the world price of grain, which is then supplemented by a constant margin representing transaction costs to form the totally elastic supply curve of imported grain s (i). That is to say, grain is available to a single small country on the world market in effectively unlimited quantities at an exogenously determined, fixed price.

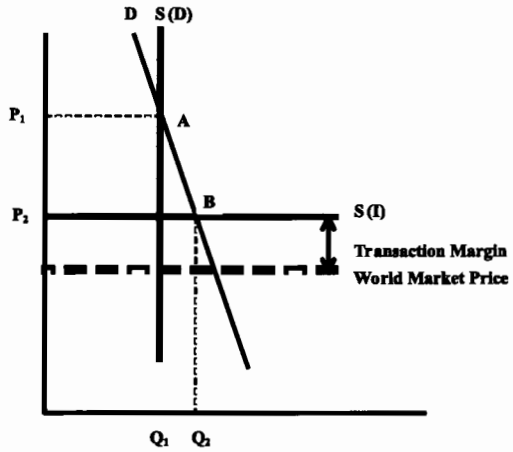


Figure 4.2

Of the two supply curves s (D) and s (I) the one that intersects the demand curve further down will determine the market price. In the diagram the market clearing intersection moves from point A to point B as a result of the availability of imports. Compared to an exclusively domestic equilibrium, price falls from P_1 to P_2 and volume increases from Q_1 to Q_2. As long as the supply curve s(I), consisting of a horizontal world market price line supplemented by a transactions margin, intersect the demand curve below its intersection with the domestic supply curve, grain will be imported and the price will be the (supplemented) world price. In reality, however, there were problems.

Not only did the s(D) curves shift dramatically from one year to the next in response to harvest outcomes, but the world market prices also fluctuated. Thus, the s(I) curve also shifted. Inevitably, therefore, as illustrated in figure 4.3, the model will become more complicated; the unstable nature of domestic supply is in this diagram represented by the three, still perfectly inelastic, s(D) curves. In addition, there are two s(I) curves that illustrate the possibility of two different world price levels. It is assumed that the shifts in the s(D) and s(I) curves are independent of each other. Since there are three possible domestic supply curves and two import supply curves, there are numerous intersection points with the D-curve. But all will not apply as market eqwilibrium points. In each s(D) case only that intersection point will apply that offers the lowest price.

When domestic supply is represented by $s(D)_1$, then, depending on whether import prices (world prices supplemented by transaction costs) are at $s(I)_1$ or $s(I)_2$, intersection with D will occur either at point X or point Y. In either case the world import price will prevail, but the effect on the price, and the level of imports, will be greater at Y than at X. The intersection point with $s(D)_1$ will never apply since both import alternatives are lower. If domestic supply is at the $s(D)_2$ level, however, imports will only play a role and the import price prevail if, as at point Y, $s(I)_2$ applies. When, however, $s(I)_1$ is the case the intersection point W will apply. If the

domestic harvest is sufficiently good so as to result in $S(D)_3$, imports will play no role at all since the domestic price at point U is below the two import price alternatives.

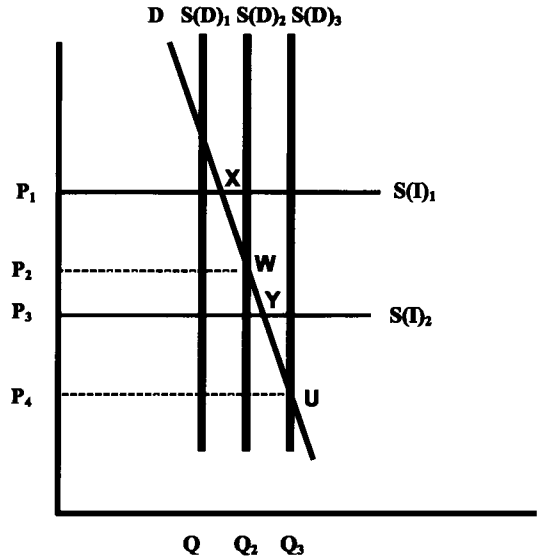


Figure 4.3

Note: The Following Intersection Points Apply:

	$S(D)_1$	$S(D)_2$	$S(D)_3$
$S(I)_1$	X	W	U
$S(I)_2$	Y	Y	U

Stylized Fact Calculations

This model can be elaborated further by using it to generate hypothetical examples. This procedure is often referred to as stylized fact calculations. On the basis of the discussion in chapter 3, two alternative harvest CV values have been selected. It is also possible to construct a demand function based on assumptions concerning price elasticities of demand. Combining the probability distribution of harvest outcomes – representing the year-to-year fluctuations in domestic supply – with the demand function yields a frequency distribution of grain prices whose average expected price and variance can be calculated. This distribution can then be compared with a probability distribution of import prices. By selecting the lowest price indicated by the two distributions like in figure 4.3 it becomes possible to generate a new probability distribution of market equilibrium prices, sometimes based on marginal domestic and sometimes on marginal import supply. Of course, also this distribution will have a calculable average expected price and variance. The hypothetical calculations I have made are based on the following assumptions:

1) Harvest Variability: on the basis of figure 3.6, two alternative CV values

have been selected for the probability distribution of harvest outcomes. As an approximation of integration at the county level, 20 has been chosen. For a wider, close to national, level of integration, this number was reduced to 15 as the alternative.

2) Import prices: this estimate consists of two parts. First, world prices are assumed to have a probability distribution with an average price of 8 and with a CV of 30. This value corresponds to the measured coefficient of variation for prices in Gdansk, the leading port for Baltic grain exports. Second, a fixed amount of 2 is taken as an estimate of transaction costs. Together the two components result in a mean price of 10 and CV of 25 for the probability distribution of import prices. Domestic harvests and international prices are assumed to be independent of each other.

3) Price Elasticity of Demand: two alternative elasticity values have been implemented, -0.4 and -0.6. These choices are discussed further in the appendix D. The demand curves have then been calculated assuming the price at median harvest is 10 and that they have constant elasticity. This last assumption results in extremely high prices for low quantities. See figure 4.4, where the two alternative demand curves are displayed.

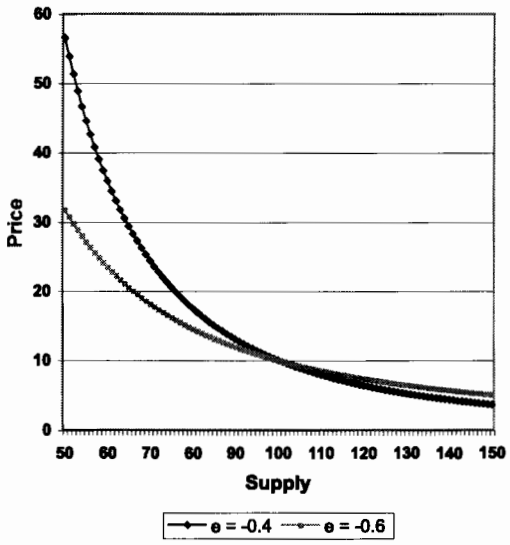


Figure 4.4
Price Elasticity Alternatives

Combining the two alternative demand curves with an annual supply of grain equal to the probable harvest (i.e. no grain stores are carried over from harvest to harvest) based on each of the two posited harvest CV:s yields four different outcomes of probability distributions of prices. Introducing the possibility of imports increases the number of possible distributions to eight. For each of these its dispersion (volatility) has been calculated and expressed as the standard deviation (SD). The alternative outcomes are displayed in figure 4.5. Beginning with the

four alternatives based solely on domestic supply, they vary greatly in response to differences in assumptions in both the price elasticity and the degree of market integration. Low elasticity and high dispersion of harvest outcomes both have major independent impacts and, when they are combined, the effect is even greater. The SD of the alternative based on a harvest CV of 20 and a price elasticity of -0.4 is almost twice as high as that of the one based on a CV of 15 and an elasticity of -0.6. (See figure 4.5)

Although a larger price elasticity and a greater degree of domestic market integration may substantially reduce price dispersion or volatility, they are overshadowed by effect of imports. These provide a much greater reduction in price volatility. The alternatives with imports available have a clearly lower volatility. Moreover, once imports are included, any further changes in price elasticity or market integration make very little difference. Thus the SD differences among the various alternatives including imports are very small.

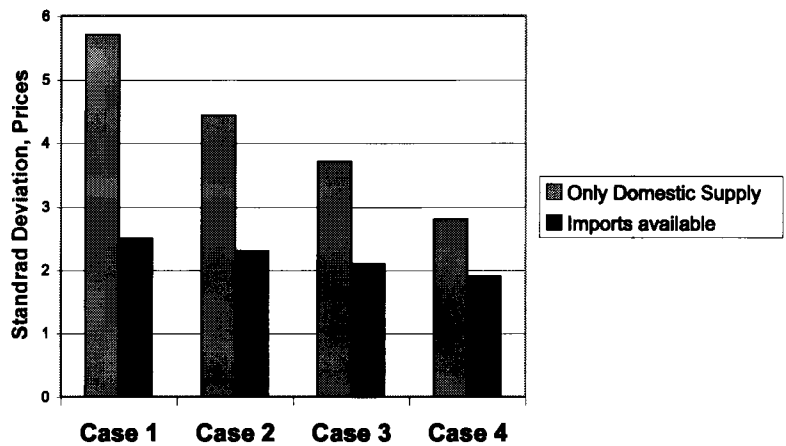


Figure 4.5

Price Volatility (standard deviation) Alternatives

Note:

Case	Elasticity	Harvest CV
1	-0.4	20
2	-0.4	15
3	-0.6	20
4	-0.6	15

The reduction in price volatility caused by the availability of imports is the result of a large decrease in the probability of very high prices. This effect is in accord with the model displayed in figure 4.3 and is illustrated by the calculated probabilities of very high prices contained in figure 4.6. Without imports the risk of prices rising to 15 or higher exceeds 22% if harvest CV is 20. Even if the CV is 15 the risk of such high prices is more than 16%. The availability of imports,

however, reduces that same risk to 1 or 2%. It is the avoidance of such extreme prices that allows imports to markedly reduce price volatility. Increasing domestic market integration, which here is here illustrated by moving from a harvest CV of 20 and to one of 15, is valuable but not nearly as important as availability of imports.

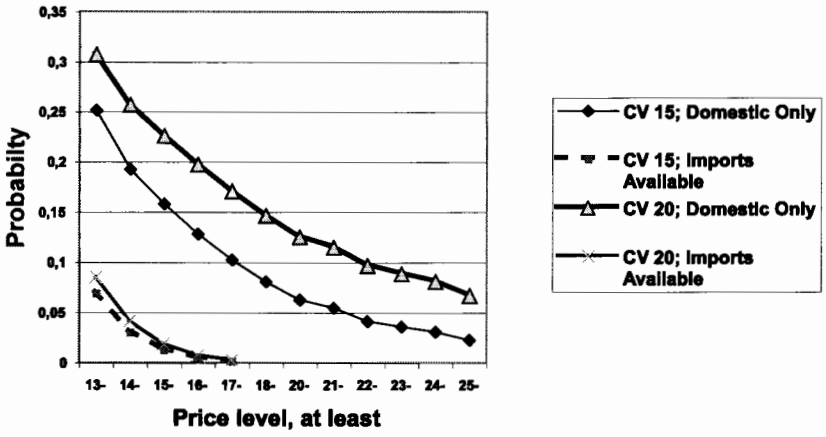


Figure 4.6
Given Price Level (or higher) with a Demand Elasticity of -0.4

The problem with high grain price volatility was not just occasionally very high prices, although they certainly caused the most serious social crises. Very low prices also presented a problem in that they discouraged production. Thus, the effects of *vanpriser*, i.e. problematically low prices in response to bumper crops, also deserve attention. The probability of price of 6 or lower was cut in half – from 12 to 6% – when domestic market integration reduced domestic supply volatility from a CV of 20 to 15, (and an assumed elasticity of -0.4). When looking at the probabilities of prices that are less drastically low, the differences between the alternative assumptions become less pronounced.

Storage

Stylized fact calculations can also be used to study the consequences of harvest-to-harvest storage. Thus, for example, it might be assumed that one third of the difference between actual production above some arbitrary level, say 100, will be subtracted from current supply and put into storage in years when harvests are above this level. When the harvest is less than 100 one third of the deficit is taken out and added to the supply. This is a very ambitious assumption and it is doubtful whether it could ever be realized and is used here only to make the effect large enough to be easily distinguishable.

If we assume a bumper harvest, which is 25% above the average, the total supply will be reduced from 125 to 116.8 if 1/3 of the 25 are put into storage. Under the assumption of an elasticity of 0,4 and a price of 10 when supply is 100, this will result in a price that is 6.8 instead of 5.7. Under the assumption of an elasticity of

-0.6 the corresponding prices will be 7.7 instead of 6.9. The effects of storage will thus be a price increase by 12 to 20% depending on the elasticity assumptions.

As long as there are imports available it is difficult to imagine that additional supply from storage would offer any significant effect on high prices since the marginal supply determining the prices will still come from the world market. But in a closed economy without imports there could be advantageous implications from supply from storage. A harvest shortfall implying only 75% of the normal level would result in a supply of 83.3% when storage is added. That would give a price of 15.8 instead of 20.5 when elasticity is -0.4 and a price of 13.6 instead of 16.2 when it is -0.6. Supply from storage would thus give some price reductions but it can in no way eliminate strong price increases and it is hardly an effective substitute for imports as a protection against high prices.

Conclusions

Theoretical analysis indicates that the integration of the domestic market could reduce grain price volatility and that an increase in the price elasticity of demand would reinforce such an effect. By far the most important factor in damping down grain price volatility, however, was the availability of imports. In fact, import prices quite often determined the price that all domestic buyers had to pay. They did this by replacing the domestic output that was lost when harvests were poor, thus preventing high prices from occurring. They did not, however, prevent the low prices that resulted from bumper crops. Domestic market integration, however, could reduce the risks of very low prices. Large-scale storage could also have a similar effect in reducing risks for very low prices, but it was far less effective than imports in reducing the risk of very high prices. Thus, availability of imports was clearly of great importance to domestic buyers of grain, while domestic market integration and large-scale storage to some extent could serve the interests of suppliers.

These conclusions raise several additional questions. Are the assumptions of this model realistic? Was there actually a world market into which the Swedish domestic market could be integrated? How did the Swedish import trade develop? To what degree did Stockholm grain prices co-vary with domestic harvest outcomes and with the international prices? In the next chapter an effort will be made to verify the assumptions made in the previous discussion.

Footnotes

[1] Jevons (1871). He suggested: $p = 0.824 / (q-0.12)^2$. According to Stigler (1954) it was Wickstead who first found the exact equation to express Davenant's values: $p = (1500 - 374q + 33q^2 - q^3) / 60$. Fogel (1992) has suggested a more approximate but convenient formula $Q = 1.00\ p^{-0.403}$

[2] Hoskins (1964) and (1968).

[3] Bauernfeind (1993) is referring to the 30-year war in Germany.

[4] This discussion only relates to the short run.

[5] Jörberg (1972b) and Hegardt (1975).

[6] Jörberg (1972b) p.72.

[7] Jörberg (1972b) p.75.

[8] Jörberg (1972b) p.9.

[9] Hegardt (1975) p.172.

[10] Lindgren (1976).

[11] Jörberg (1972b) p.75.

[12] Leijonhufvud (2002).

[13] Engel (1861).

[14] Olsen (1942-44) "Kornpriserna blev i det vaesentligste bestemt af priserne på det hollanske marked. Priserna var her bestemt af utbuddet i Östersjöprovinserna och efterspörgelsen i Sydeuropa, og Danmarks utförsel var i sammenligning med eksporten fra Östpreussen, Polen och Livland så beskeden at den ikke havde större mulighed for at påvirke de holländske priser väsentligt i nogen Retning. Exportprisen var afgörende for Hjemmemarkedets pris. Denne kunde dog till en vis grad reguleres ved Regeringsforanstaltninger."

[15] Person (1999) p.65.

CHAPTER V

Price Integration: The Empirical Evidence

The model outlined in the previous chapter represents one approach to the study of price integration. Is it possible to confirm it empirically, or at least to verify that it is compatible with currently available data? In addressing this problem, it may be useful to begin by investigating some of the model's basic assumptions. The question thus raised include the following:

1. Was there actually a world grain market into which the Swedish domestic market could be integrated?
2. How did Swedish grain imports evolve over time?
3. To what extent were Stockholm grain prices correlated with world market prices and with the outcome of domestic harvests?

The "World Market": From the Baltic to the North Sea.

During the 16th century, Dutch shipbuilding techniques were more advanced than those of any other country. The vessels they built were larger than those of the Hansa or Venice. In particular, the newly designed *fluyt* ships had a cargo capacity that exceeded that of any vessels previously used in ocean shipping. This advantage allowed the Dutch to establish a worldwide trade network following the shipping lanes recently explored by the Spanish and the Portuguese. It was this transoceanic trade that made the Dutch famous, but it was the Baltic grain trade that made them rich. "*The Mother of All Trades*", the Dutch called it. Their new ships sharply reduced transport costs. Passing through the Sound, the *fluyts* sailed back and forth between the ports along the southern and eastern shores of the Baltic and the North Sea.[1]

The Netherlands was a densely populated country that was incurring extremely high costs in reclaiming land from the sea. It was more profitable to use this new, extremely fertile, land for the production of high value added products, such as cheese and tulip bulbs, rather than grain, which could be imported at low cost.

The Dutch were economically motivated businessmen. Having established an on going import trade in grain, they soon realized that a major profit opportunity existed every time there was a crop failure anywhere in southern Europe. Local prices would rise, and the Dutch could re-sell Baltic grain at highly attractive prices. The demand side of this Dutch created "world market" thus had two sources, a permanent demand in Holland and an intermittent and variable demand in the countries south of the North Sea and in the Mediterranean. As verified by the accounts of *Östersjötullen* (the Baltic customs), the Netherlands quickly became the dominant importer of Baltic grain, and Amsterdam became the center of the world grain trade. The most important export port in the Baltic was the Polish city of Gdansk (Danzig), but cities in Livonia (Riga), Kurland and East Prussia (Königsberg) also contributed substantially to the trade. During the 15th, 16th and the first half of the 17th centuries, the Baltic was the only region that could supply large volumes of grain for export. The grain arrived in the port cities on rafts during the spring, when the rivers where high enough to permit such transport. Exports thus lagged harvests by close to a year. Supply was quite inelastic. Only Gdansk had sufficient storage capacity to permit large quantities of grain to be stored in anticipation of higher prices. The volume supplied varied from year to year not only because of harvest fluctuations, but also because of the rather frequent export prohibitions that applied especially to the Baltic provinces. This policy was continued by the russian government after these provinces came under its control.

During the 17th century there existed a clear negative correlation between short-term variations in the volume of grain shipments through Öresund and prices in both Gdansk and Holland. The natural conclusion is that reductions in supply resulted in higher prices. This correlation slowly diminished, and eventually disappeared totally, during the 18th century. There are a number of possible explanations of this development. For one thing, alternative sources of supply were now appearing. Examples are Archangel and, following the construction of canals linking the Elbe to areas to the east, Hamburg. Even more important were the intermittent exports that emanated from England during bumper crop years. These British exports were subsidized by the British government – the so-called Bounty. This politically motivated innovation, an early forerunner of the current EU Common Agricultural Policy subsidies, was strongly condemned by Adam Smith[2]. Supported by this policy, English exports constituted more than half of all the grain imported to Amsterdam during the period 1700-1770.[3] As a result, the grain supplied by the Baltic ports had much less effect on prices during the 18th century than had been the case earlier. Indeed, there now existed a positive correlation between prices and the volumes shipped from that region. A particularly interesting result is Staffan Högberg's discovery of a close link between the volume passing through the sound and the price margin between Gdansk and Amsterdam during the 18th century.[4]

During the 18th century the French *economists* claimed that Dutch prices were more stable than others because Amsterdam, being at the center of the world grain trade, was more closely market integrated than any other city. In fact, price volatility in Holland was not particularly low. Indeed, it even was high compared

to Tuscany and England. A possible explanation to why prices were volatile in the most market integrated city in the world was that the Amsterdam market, as just discussed, was more exposed to intermittent influences than were other markets. These might be increased demand to cover temporary shortages in southern Europe or increased supply because of subsidized English exports.

Price determination in this, like any other, market can be visualized as the balancing of expected supply with expected demand. The former would be based on the harvest outcomes that determined the following year's exports, principally from the Baltic area and Britain, modified by expectations of policy measures ranging from export prohibitions to subsidies. Demand would be based on expectations of domestic deficits, plus the situation in the various southern European markets. The Amsterdam market was unique in that not only supply, but also demand, shifted dramatically from year to year. In such a situation, a large number of buyers is no guarantee of price stability.

Seventeenth century price data from the various Baltic ports displays great uniformity with regard both to the level and the movement of prices. The grain series from Gdansk are exceptionally long. Gdansk was cut off from polish supplies after the first partition of Poland in 1772, and shortly thereafter its position as the leading Baltic export port was taken over by Königsberg. The question to be answered is whether or not it is appropriate simply to accept the series of Gdansk prices as a proxy for the entire Baltic region. For a limited period during the 17th century concurrent prices are available for Riga, Narva, Tallinn, Königsberg, Stettin and Greifswald. Some of this data has been included in figure 1.

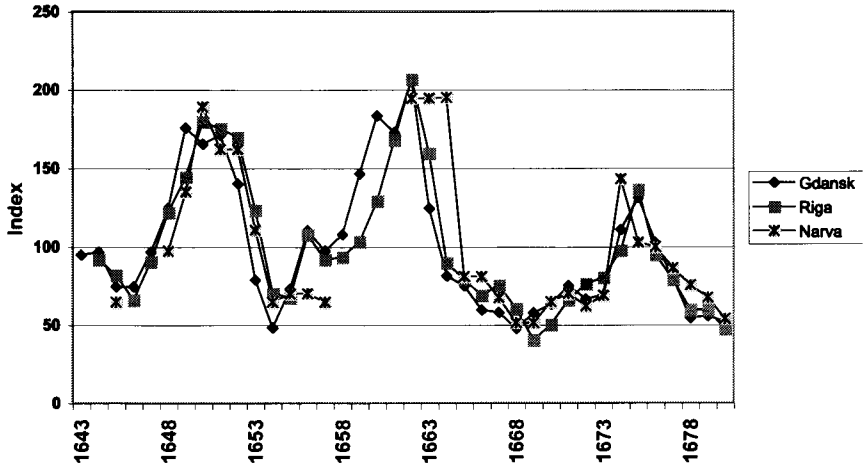


Figure 5.1
Rye Prices in Baltic Ports 1644-80. Index: Average 1644-80 = 100
Source: Likvidationskommissionen. RA; Pelc (1937)

The conclusion to be drawn from the chart is clear. The co-variation of prices between Gdansk and the two cities in the Swedish Baltic provinces Riga and Narva is very close. The answer to the first question posed in this chapter thus

seems to be that there existed an integrated world market for grain that was larger and more integrated than that for any other commodity.

The question concerning the development of Swedish grain imports is difficult to answer for the 17th century. For that century data on Swedish grain imports is available only for occasional years. Still, it is possible to gain a rough impression of developments. In his study of the trade in Stockholm during the first half of the 17th century, Åke Sandström found evidence of significant grain exports in the years 1622, 1638, 1640 and 1646, but also substantial imports in 1637 and 1640. He thus concluded that the trade in grain varied greatly from one year to the next, not just in volume, but even in direction. Both exports and imports were possible.[5]

No systematic studies of the Stockholm customs records for the second half of the 17th and the early decades of the 18th centuries have been done. There is, however, a substantial number of documents, such as the minutes of the Royal Council (Rådet), that at least mention the importation of grain. In addition, largely complete trade records exist for the single year of 1685. All these sources indicate that grain exports from Stockholm had largely ceased by the middle of the 17th century. This conclusion is also supported by the accounts of ships passing through the Sound. By the same token, import years were becoming more frequent and the quantities involved were getting larger. These trends appear to have continued into the early 18th century. The existing data for a few years during the 1720s also indicate substantial grain imports.

Starting in 1738 comprehensive annual data on the volume of all types of Swedish imports, including all varieties of grain, is available. Rye imports remained at a high level throughout the century. With the coming of the 19th century, however, they started to decline. By 1820 they had ceased entirely except for a few occasional years of crop failure. After the middle of the 19th century rye imports again began to increase and at the same time an important export of oats emerged.

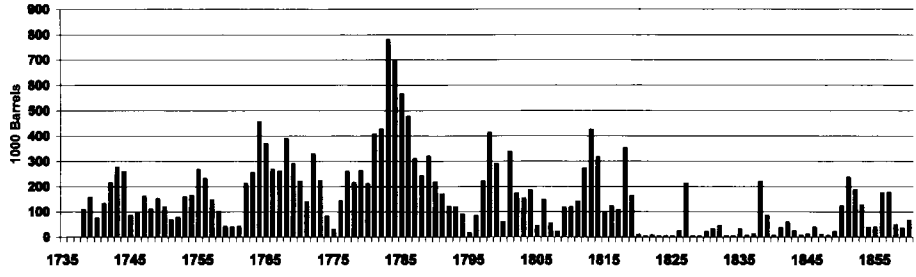


Figure 5.2
Swedish import of rye 1738-1860. Thousands of barrels.
Source: Åmark (1915), SCB (1972)

Geographically, the international trade in grain passed very close to Stockholm. In fact, during the 17th century much of the supply originated in territory controlled by Sweden. Riga (Swedish since 1629), as well as Tallin (Reval) and other Estonian ports was for many years a major exporter of grain through the Sound. In addition, ships frequently sailed between these ports and Stockholm for all sorts of reason.

Indeed, this busy commerce continued during the 18th century, even after Russia had seized political control of the area.

There was considerable ship borne commerce between Stockholm and Gdansk (and later Königsberg) where there was a market for Swedish iron. Thus, information on international prices for various products must frequently and quickly have become available in Stockholm. In fact, whenever a grain deficit developed in Stockholm, it was simpler to bring additional supplies from across the Baltic than from other parts of Sweden. Thus, in the 17th and 18th centuries there was much less trade with Scania than with the Baltic region. Moreover, during the 17th century a number of the largest land owners and suppliers of grain in the Swedish controlled Baltic provinces were members of the Swedish upper nobility, often members of the Royal Council (e.g. the Oxenstierna family).

In years when supplies were short the desire to provision the Swedish army at reasonable prices sometimes caused the government to issue export prohibitions, thus hampering the export trade. In some cases, these measures were even applied to shipments to Sweden proper. After the accession of Charles XI in 1672, however, they became much less frequent. In the 18th century, after the russian conquest, these prohibitions were occasionally issued by the new rulers. The Russian policy was to prohibit exports whenever the Moscow price of rye rose above one rubel per chetwert[6]. In the Swedish import statistics there are, however, significant volumes of rye from Russia reported even in years when there were export prohibitions.

It can be concluded that, since the second half of the 17th century, there was always a potential, and occasionally an actual, importation of grain from the Baltic area to Stockholm. Over time the years of actual imports became increasingly frequent until, starting in the early decades of the 18th century, it turned into a permanent, although in volume terms highly variable, flow of grain to Stockholm. These regular imports continued until 1820.

The transaction margin is defined as the difference between the price in the exporting port and in Sweden. It thus represented the sum of a number of components, such as the cost of loading and unloading the ships, freight charges, insurance, customs duties and port fees, as well as the trading profit. Moreover, the Stockholm price was per *tunna*, while that in the baltic ports was measured in *last*, a measure twenty times as large. It thus seems likely that the price differential also to reflects some portion of the move from wholesale to retail.

Among the implicit assumptions on which the model presented in chapter 4 is based is that Sweden was a minor importer and thus a price taker on the world grain market. In addition, it was assumed that Swedish importers operated in a freely competitive market, allowing the supply price to be passed on to consumers without any monopoly based markups.

The transaction margin played an important role in the trade, but information concerning it is limited. It is essential that what is available be collected and analyzed in terms of its level, long-term trend and short-term variability.

Åmark presents two bits of information concerning transfer costs.[7] The first of these is from 1731 and refers to the cost of one barrel barley from Scania, which are here recalculated into HB:

Table 5.1
Transaction Cost for One Barrel of Barley Shipped from Scania to Stockholm in 1731.

	HB
Sea freight and insurance	0.28
Handling	0.05
Measurement	0.06
Domestic duties	0.22
Total	0.60

Another piece of information from 1753 indicates that sea freight and insurance totalled 1 1/3 and 2 dsm in summer and autumn respectively. Recalculated into specie and adding import duties, these two values correspond to 0.8 and 1.0 HB. It is, however, unclear to what extent these data are representative.

One source of information on the long-run evolution of shipping costs is the work of van Tielhof. Working with Dutch sources, she has collected freight charges for grain between the Baltic and Amsterdam for a number of years between 1650 and 1758. While she found no real trend, she discovered that freight rates were almost as volatile as grain prices. During the period 1700-1750 the coefficient of variation was over 26. This result makes it difficult to conceptualize the transaction margin as a fixed amount to be added to fluctuating world market grain prices. Furthermore, van Tielhof found little or no correlation between these freight costs and either the volume trade passing through the Sound or the level of world prices.[8]

During the 17th and 18th centuries tariffs were principally intended to raise revenue rather than to protect agriculture. The constantly fluctuating grain prices makes it difficult to determine the general level of the grain tariffs. An estimate that they constituted 10% of the total import value, however, is probably not far off the mark. As David Ricardo noted, the tithe placed on domestic production approximately off set such an import tax. Thus the contemporary tariffs tended more to equalize the competition between foreign and domestic producers than to provide protection against imports.[9] In the last quarter of the 18th century a system with variable tariffs was however introduced and used to some extent. The tariffs varied between zero and at the very highest 0.5 HB or 20% of the average price in Stockholm. The median tariff during the last quarter of the 18th century was 8%.

Starting in 1820, however, the situation changed drastically. New duties amounting to between 50% and 100% of the import price were introduced. Their severity caused Åmark (1915) to label them prohibitive. Only in a few years of serious crop failure, such as 1826, were the tariffs lifted. They remained in force, if at declining levels, until the mid century when the wave of free trade reached all the way to Sweden.

The assumptions concerning actual or potential imports and the availability of a world market appear to hold for most of the entire period 1650-1815. Even if the quantity imported never exceeded a few tenths of total consumption (itself a highly uncertain amount), however, the model from chapter 4 indicates that they may have been large enough to influence prices. But prices could also be influenced by variable transaction costs. Thus, it would be extremely helpful if empirical evidence on the prices in Sweden and the World market could be located.

Influences on Stockholm Prices: Some Empirics

1650-1720

There was hardly any growth in production of grain in Sweden during the 17th century. From a diagram in Myrdal (2000) where he estimates the production development one can infer that the annual average growth for the period 1600–1720 was less than 0,2% while population is estimated to have increased by an average of 0,4% which of course must have deteriorated the balance of grain.

Stockholm having been an insignificant rural village in the beginning of the century, had in 1650 become the administrative centre of a Realm that for a short time appeared as a great power and that dominated the Baltic and northern Europe. This was a position that also linked Sweden closer to the centre of Europe. So did also the more and more frequent deficits in grain, which linked Stockholm with the international grain market in a more regular way. And the beginning was rather dramatic.

A severe grain price crisis started in both England and Tuscany in 1647. In the following year there was a strong increase in Paris too. There was an upsurge in demand for imported grain in western Europe, and the volume exported through the Sound was very large in 1649. The prices increased by more than 100% in Holland and in Gdansk. Somewhat later they also turned upward in Gävle – the only place in Sweden from which there are monthly data available for this period.[10]

The harvests in Sweden in both 1649 and 1650 were poor according to recorded statements in documents[11]. In 1650 there was a deficit, which the Board of Trade, *KommersCollegium* tried to cover by ordering the Governors General in the Baltic provinces to buy grain for shipping to Sweden, and import duties were temporarily removed. Prices in Stockholm had during the first part of the century as an average been lower than in the Baltic export ports. Since international prices continued to rise, the Swedish prices in 1650 had to increase even more than the international prices in order to reach a level where they would cover both the purchasing costs in Riga, which were equal to the world market price, and the transaction margin necessary to get the grain to Stockholm. Between 1648 and 1650 the Stockholm prices increased by more than 130 per cent.

In 1650 severe political uprisings had started in Poland[12] and developed into something similar to a civil war which had repercussions on the exports from Gdansk during the years 1650-53 thus adding a supply shock, which further prolonged the ongoing west European price crisis. When there, however, in 1651 was a good harvest in Sweden there was no need for imports any longer. Prices fell in Stockholm while they remained high internationally. But in 1652 there once again was a bad harvest in Sweden, and prices then had once again to return to the previous high level. When prices peaked in Stockholm in 1652 they reached almost 4 HB, which can be compared with the average for 1635–1647 that was 1½HB. This was by far the highest price recorded during the whole century.

Internationally there was a general fall in prices in 1653, and in Sweden the harvests were excellent. This meant that prices in Stockholm fell even quicker than elsewhere until they were even below the level in Gdansk. (The city of Gävle shows a remarkable fall from 18 dlr kmt in May to 6½ dlr kmt in September)[13]

The 1649–53 crisis constitutes the first episode where it is possible to see that the Stockholm prices were orchestrated by the world market. After this dramatic episode a long course of almost equally dramatic and complicated events, including numerous wars, followed. The government, particularly the Regency after the death of Charles x Gustavus in 1660, initiated far reaching but unsystematic and not very successful attempts to regulate the grain market by export bans and export duties etc. The purpose was less to stabilize market prices and more to secure the provisions for the Swedish army, which was more or less permanently acting in various parts of the Baltic region.

In 1657-63 the Gdansk prices were higher than those in Stockholm although harvests seem to have been poor. It is difficult to imagine a greater disorder in the market. There were wars, civil uprisings and political interference in the market with export bans and various form of extraordinary tariffs etc. which all means that the prices quoted in Gdansk hardly reflect a market in a meaningful way. For the years 1658–1660 there is no statistics for the trade through the Sound.

There were periods with very poor harvests into the early 1670s and in the 1690s when there were some very severe famine years, but there were also periods with a comparatively better situation like the early 1680s and 1700–05. In official documents there is sometimes information that indicate imports and apparently with increasing frequency and magnitude. Axelson quotes minutes from the King's Council where it is said that import in 1695 reached 800 000 and in 1697 it was 600 000 barrels, huge amounts of imports that were not to be surpassed until the 1780s[14].

The poor harvest outcomes in 1717 and 1719 are also clearly reported in the sources. Strong price rises increased the margins above international prices substantially. Both price crises seem to have had mainly domestic origin, since there were much less movements abroad. There is no evidence about imports. The serious currency problems and great general disorder that Sweden suffered from in that time were perhaps an obstacle to import.

The period 1650–1720 gives clear examples of strong influences on prices from both volatile domestic harvests and from international prices. The period is also characterised by a mixture of wars and political interventions. Although there is no continuous series of foreign trade with grain, it is clear that imports took place in a number of years. The impression is also that the years with import became more and more frequent during the course of the period. Imports or at least potential imports seem to have been the case apart from the frequent years with political disturbances because of war, blockades, export bans etc. The increasing frequency is confirmed by scattered data from various political and administrative documents. And the closer relations with the world market prices are also reflected in the diagram with the rye prices in Stockholm and Gdansk.

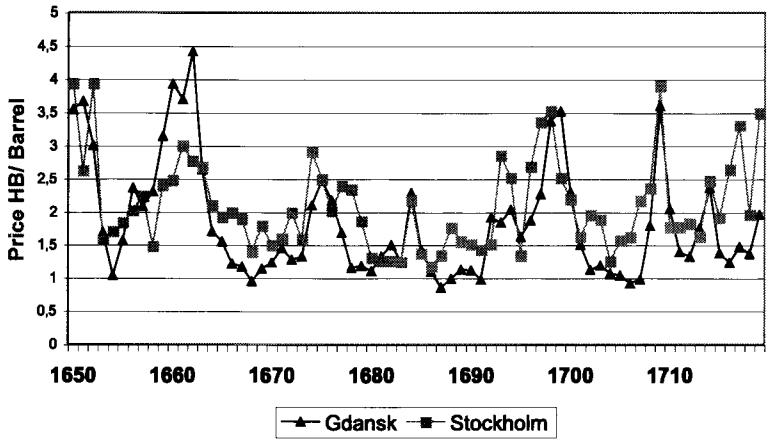


Figure 5.3
Rye Prices in HB in Gdansk and Stockholm 1650-1719
Sources: Stockholm: See figure 2.2; Gdansk: Pelc (1937) and Furtak (1935)

1720-1775

In the previous period imports to Stockholm were intermittent, but in the period 1720–75 they became almost permanent – although highly variable. Although there were strong annual variations there was a clear increasing long-term trend in imports from the 17th century until the 1780s when the trend peaked and turned down (figure 5.2). Rye prices in specie (HB) peaked in the beginning of the 19th century (figure 2.2) and so did the relative price rye/days wage that had also increased during the whole 18th century.

Through the imports the prices in Stockholm were under almost permanent international influence. The poor harvests of 1734 and 1735 are for example not reflected in the price indices at all since there was low price import available to cover the needs. The international price crisis in 1740 provides an interesting example in the opposite direction. In western Europe the probably most severe price crises during the whole century appeared in the years 1740 and1741[15]. There were very strong price increases in Gdansk, Holland and England in 1740. In 1741 the prices were still higher in Holland and France, approx 100% above the preceding 11 years. In Sweden prices also increased but they never reached levels as high as in the other European cities, and Swedish harvests were, if not good so at least not disastrous. It seems clear that the prices in Stockholm were driven by the international prices but not to the full extent. The price margin between Stockholm and Gdansk turned negative in 1740, and there was very little import. It is also of interest to study where in the country the price increases in 1740 were the strongest. They increased far more in the counties of Blekinge (Karlskrona), Göteborg and the Stockholm–Bergslagen area than in other parts of the country. These areas are just the ones where the main part of the imports generally took place. This is thus a further indication that the price increases that took place were imported.

In 1743 there was a very poor harvest in eastern Sweden, but in spite of that prices were significantly lower than in 1740 and 1741 since by then the international prices had fallen. In 1756 poor harvests in Sweden caused a price crisis since the deficit this time coincided with rising prices in England and Germany, which meant that there was no import available to keep prices down. The crisis in 1771 was the most serious price crises in Stockholm during the whole century. Even if there is no tithe data on harvests for that year, there are abundant reports about crop failures in Sweden. The famine also brought serious diseases and mortality rose to very high levels. The same is however true for many other countries e.g. Germany where the crises was both deep and widespread. These two last crises are examples that international integration did not help to keep Swedish prices down when the domestic crops failed and they were correlated with similar crises in other countries.

In 1750 the harvests in Sweden were extremely good and prices were very low, but the price margin was maintained and the explanation is that prices in Gdansk went down as well. The good harvest was however reflected in the fact that imports in the following year was cut by half. In 1737 after a very good harvest in Sweden there was a price decrease in Stockholm that eliminated the price margin and reduced imports. The very good harvests in 1759 are reflected in both an unusually low difference in prices between Stockholm and Gdansk and a very low volume of import that and the following year.

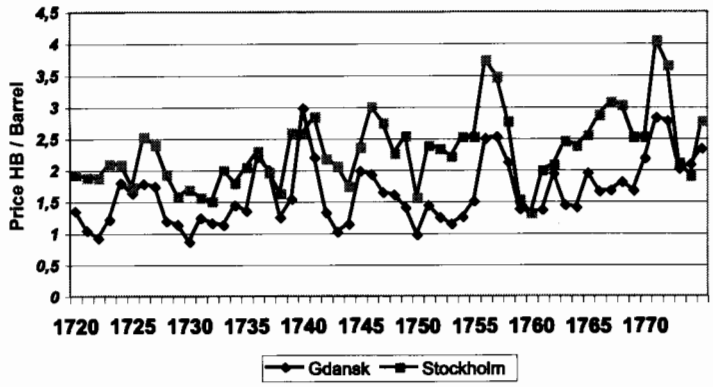


Figure 5.4
Rye Prices in Gdansk and Stockholm 1720–75
Sources: Stockholm: see figure 2.2; Gdansk: Furtak (1935)

After 1775

The rather clear relations in the previous periods between the world market and the domestic prices in Sweden became more complicated in the 1770s. A number of new circumstances were added and they all had an impact. One was that the grain exports from the Baltic had decreased for a long time and other sources of supply had become almost twice as important in the north European market. That meant that the market situation in the Baltic export ports was no longer

decisive for the world market. The Swedish imports of grain had at the same time grown so much that in some years the imports of rye to Sweden amounted to volumes almost equal to the total shipments from the Baltic through the Sound. The assumption in the model of Sweden as a small purchaser in an infinite world market did no longer hold true. The new Swedish governmental organisation for distilling and storing of grains purchased huge amounts of grain both domestically and abroad. A further factor was an attempt from the Government to make the import tariffs for grain depending on the domestic market situation.

From the middle of the 1780s the harvests became much better than in the beginning of the decade. That was obviously not only a question of weather but there are many indications that there was really a new trend with production growing at a significantly higher rate than previously. It is not easy to distinguish and clarify the impact of all these various but partly interrelated changes. That they together had an impact on the prices and how they developed is, however, highly probable. What we can see in the statistical data is that the covariance with Gdansk prices became weaker, but it is difficult to be sure since the Swedish monetary system was in great disorder particularly between 1789 and 1803 with *Banko* and *Riksgälds* currencies with varying and unclear exchange rates. A further circumstance of great interest here seems to be an astonishingly low level of price volatility both in comparison with previous periods and with other countries.

The price formation in the first decades of the 19th century was further complicated by the Napoleonic wars which had serious implications on production of grain and on demand because of large scale purchases for the very big armies and in addition to that there were devastating effects on the currency systems for reasons of war finance. In Sweden there were also currency problems related to the devastating war in 1808–09, which meant that Finland was conquered by Russia. Nominal grain prices were everywhere extremely high, but once the wars ended the price curve for grain turned down dramatically both internationally and in Sweden. In the period that then followed Sweden tried to isolate itself from the world market. Grain production had increased up to a level of self sufficiency, import tariffs were made prohibitive and now the time for domestic integration had come.[16]

Domestic Price Integration

The previous analysis of the price integration with the world market relates to the Stockholm prices. A natural question is of course to what extent there was a domestic price integration.

There is evidence of strong similarities in price movements within the iron works district *Bergslagen* and with Stockholm going back to the 17th century. The Uppsala University price records used by Hegardt yields a high degree of correlation between Stockholm grain prices and those in *Bergslagen* and in Falun going back as far as the period 1635–1650 (r=0.76 and 0.74 respectively). At that

time, *Bergslagen*, including Falun, was a forested area with rapidly expanding iron and copper melting industries and a growing grain deficit. Thanks to its considerable metallurgical exports, mainly through Stockholm, it was also more closely integrated into the world market than any other region. Thus, the close correlation of grain prices with those in Stockholm is hardly surprising. Moreover, since the University sold grain in all three market areas, it was in a position to coordinate its prices, thus maybe contributing to the integration of the three price series. During the ensuing period 1650–1719 the correlation of the prices of Uppsala University grain with Stockholm, *Bergslagen* and Falun was even closer than previously.

Table 5.2
Uppsala University Grain Price Correlations.
Stockholm with Bergslagen and Falun Respectively.

	Bergslagen	Falun
1649-1674	0.92	0.93
1675-1692	0.86	0.90
1693-1719	0.93	0.96

Source: Hegardt (1975)

For parts of this period price data from the Liquidation Commission (*Likvidationskommissionen)* also is available. It reveals considerable price integration within an area with cities along the east coast (Söderköping, Västervik and Huddiksvall), along the shores of Lake Mälar (Västerås and Arboga) and Hedemora in *Bergslagen.* For the rest of the country, including the west coast cities of Gothenburg and Varberg, there is virtually zero correlation with the east coast cities. Between Gothenburg and Varberg, two cities on the West Coast, however, the correlation coefficient was r=0.5. It should also be noted that during this period the correlation between western *Bergslagen* (Örebro and Kristinehamn) and Stockholm was not just weak, it was nonexistent.

Table 5.3
Correlations with Stockholm Prices

Arboga	1660-80	0.79
Västerås	1649-80	0.75
Hedemora	1649-80	0.51
Söderköping	1661-79	0.82
Västervik	1644-80	0.64
Huddiksvall	1644-80	0.58
Varberg	1647-80	0.26
Kristinehamn	1659-80	0.36
Göteborg	1659-80	0.22
Örebro	1661-79	0.11

Source: Likvidationskommissionen, RA

These data indicate that there was no nationwide integration of grain prices during this period. What did exist, however, was a close similarity in price movements among areas that, directly or indirectly, were involved in foreign trade. This usually involved the importation of grain via Stockholm, Gävle or Norrköping, paid for by the exportation of iron products.

For the years 1758–72 market scale prices from 70 different locations within Sweden are available. Correlating each of these with the prices in Gdansk produces a very clear pattern. Twelve sites, all of them located along the east coast or in *Bergslagen,* have a correlation coefficient of 0.80 or higher, while an additional 16 from the same regions have one between 0.7 and 0.8. By contrast, 24 sites, most of them in western Sweden or Småland, have coefficients below 0.5.

It is common practice to use the co-variation of prices as a measure of market integration. In this particular case, however, greater analytical precision might be useful. As will be reported later in chapter 8 (figure 8.1) there were shrinking price differentials and increasing price movement similarities recorded during the 18th century until the 1780s but they are not necessarily the result of increased nation wide trade integration. Indeed, there is a lack of qualitative evidence supporting such a development. Imports, however, were increasing during this period, and were arriving in more and more Swedish ports. Thus, it was not only Stockholm and its iron producing hinterland that was affected. Large sections of the country were now receiving grain from abroad. During the 1780s, when the grain deficit was at its peak, more than 20 ports received significant grain shipments from abroad (see figure 5.6 below). Thus the convergence of price levels and movements among different parts of the country does not need to reflect greater integration between various parts of the country. Rather, it might mean that more and more regions were being integrated into the same international market. When imports later declined during the 1790s, and fewer ports were involved in the trade, it was only logical that this development stopped or was even reversed. By 1820 Sweden had become self-sufficient in grain. Imports ceased and the deficit areas were by then supplied entirely by domestic production. This development did now result in a real domestic market integration that continued throughout the rest of the century.

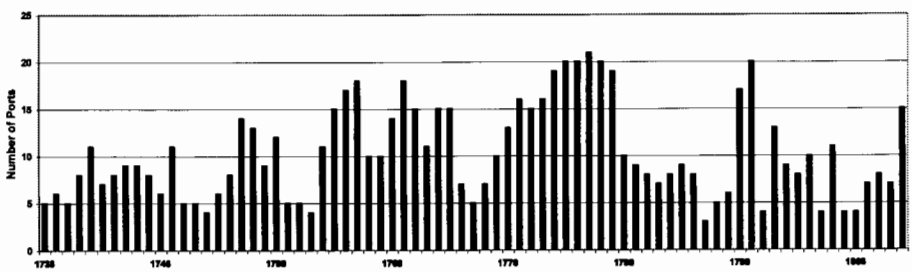


Figure 5.5
Number of Ports Receiving More than 1 000 Barrels of Rye
Sources: Kmk A. årsb. utrikeshandel. RA

Statistical Results

In the previous chapter it was hypothesized that Swedish grain prices were determined by domestic supply when the harvest was adequate, and by the cost of imported grain when such was required. In the latter case the Swedish price would equal the world price plus a margin to cover transport and transaction costs. One necessary – although not conclusive – indication that markets were integrated and imports could occur was that the differential between Swedish and world prices, at least sometimes, was large enough to overcome this margin. By comparing prices in Stockholm and Danzig it is possible to determine whether or not the differential in fact was large enough to permit imports when the domestic harvest was poor. Figure 5.7 displays the extent to which these price differentials were related to an index for harvests in eastern middle Sweden[17]. In years with good Swedish harvests, and therefore little need for imports, the differential was smaller than in years with poor harvest when there was a clear need for imports. Even though the absolute values have to be handled with care, it seems safe to assume that the lowest differentials were insufficient to permit imports while those above 0.50 probably were large enough. As already noted, transaction costs could vary a great deal.

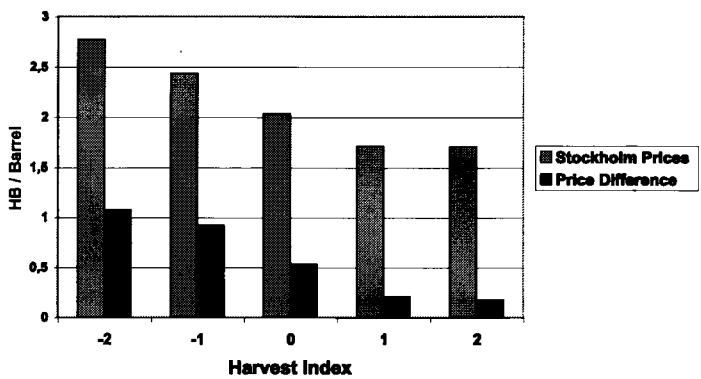


Figure 5.7

Rye Prices in Stockholm 1665-1760 and Price Difference to Gdansk at Various Harvest Outcomes. Average Values.

Note: The harvest index is based on the tithe rolls from the parishes in Uppland and Västmanland that were utilized in chapter 3. The values range from -2 (very poor) to +2 (very good). See Appendix E

Sources: See figures 5.3 and 5.4

Another approach to investigating the relationship between Swedish prices, on the one hand, and domestic harvests and international prices, on the other hand, is regression analysis. A model that predicts Stockholm grain prices utilizing domestic harvest outcomes and Gdansk prices as determinants, each having its own equation, intercepts and coefficients, has been constructed. The complete model has an impressive R^2 of 0.630. The slope coefficient for Gdansk of 0.751 in years with poor to average harvests (index -2, -1 and 0) indicates that

international prices had a major impact under such conditions. By contrast, the lower coefficient recorded for years with good harvests is evidence of reduced international influence when Swedish domestic supply was adequate.[18]

Table 5.4
Regression Model oefficients for Gdansk prices

Harvest index	Intercept	Coefficient for Gdansk prices
-2	1.178	0.751
-1	1.107	0.751
0	0.886	0.751
+1 and +2	0.886	0.549

Note: The difference between the good years (+1 and +2) and the rest is statistically significant.

The explanatory value of this model where the admittedly very rough estimations of the harvests are included can be illustrated by comparing it with the results of a simple model where only the international prices are used as the predictor. Such a model would only give a R^2 of 0.476.

The purpose of this chapter has been to investigate whether the theoretical conclusions drawn in chapter 4 can be applied to Sweden of the 18th century. In my opinion historical evidence and statistical analysis both support the hypothesis posited. Stockholm grain prices were really determined by those in the international market except for such years when the domestic harvests were clearly above average. This means that the potential for a domestic macro economic policy to impact prices in years with normal or poor harvests must have been limited or non-existent. This conclusion may be useful to keep in mind when the focus of this study now is turned to the parish *magasins*.

Footnotes

[1] Tielhof (2002).
[2] Smith (1776).
[3] de Vries and Woude (1997).
[4] Högberg (1969) p. 207.
[5] Sandström (1990) p.356-59. According to Hellstenius (1871) there are sources that indicate substantial grain exports during the 1620s. If that is correct, that trade was probably more temporary than ongoing in nature.
[6] Kahan (1985).
[7] Åmark (1915) p.53 n.
[8] Tielhof (2002).
[9] Ricardo (1923).
[10] Likvidationskommissionen D VI, RA.
[11] The political and administrative action from the 17th century related in this section is, if not otherwise said, based on Soom (1961).
[12] Englund (2000)
[13] Likvidationskommissionen D VI, RA.
[14] Axelsson (1888).
[15] Post (1985).
[16] This reflected a more general mood in the country. A well-known contemporary poet wrote about the loss of Finland in 1809 that "now is the time to reconquer Finland within the borders of Sweden".
[17] For details of this index, see Appendix D.
[18] I greatly indebted to associate professor Per-Olof Edlund for his construction of the model.

CHAPTER VI

Parish *Magasins* in Sweden: Their Origin and Evolution

A Lenghty Prelude

Sweden as a Major European Power

During the 17th century initiatives were taken that in retrospect can be seen as precursors of the parish *magasin*, the theme to which this study will now turn its focus. The first known instance of such storehouses dates from the 1650s. Following the Peace of Westphalia in 1648, Sweden had become a major European power. In 1650 this national elevation was to be celebrated with the most expensive spectacle Sweden had ever witnessed. The coronation of Queen Christina, daughter of the great Gustavus Adolphus, was intended to suitably impress the other European powers. Not everything about Sweden was impressive, however. In that same year there was a severe hunger crisis resulting from crop failure in many parts of the Country. According to the tithe rolls from eastern Sweden, the harvests were only half of normal, a severe shortfall.[1] Grain could be imported from the recently conquered trans-Baltic provinces, but organizing shipments on such an unprecedented scale was no easy task. Moreover, international prices (Gdansk) had risen to the point that they were twice as expensive as the average of the preceding ten years. Sweden had become both a major power and a country unable to feed itself. The earlier frequent surpluses that sometimes permitted grain to be exported had turned into deficits that more and more often required imports. Average prices that had been below world market levels, now rose above those levels and were 100% higher than during the preceding ten-year period. As discussed in the previous chapter, Sweden had entered the world market as an importer.

Regal as the Queen might have seemed at her coronation, she was largely powerless. Thanks to a series of wars, the strong central state created in the 16th century by her great grandfather Gustavus Wasa had given way to an oligarchy of wealthy, land-owning noble families. Per Brahe the Younger, the *riksdrots,*[2] was the richest of them all. Most of his income consisted of rents paid in kind by his peasant tenants. When harvests were poor, they were not always able to pay the rent and when the landowner lost the opportunity to sell at high prices, it was a serious

loss to him. Evicting peasants for failure to pay the rent under such circumstances, however, made little sense, since whoever replaced them would also be indigent.

On January 4, 1654, at his principal estate of Visingsborg on the island of Visingsö in the middle of Lake Vätter, Brahe declared that since "God having decided to punish the country with hard times and hunger during the years 1651, 1652 and 1653" he had decided to place a thousand barrels of grain from the ample fall harvest of 1653 in reserve. This grain was to be lent to the peasants in difficult years.

Several years later he expanded this storehouse to include salt.[3] Whether this action was motivated by true compassion for the hungry, by a fear of disorder or by an interest in helping the tenants pay their rents to him during years of high prices, is impossible to determine. In 1680, after the *reduktion*,[4] Visingsborg was confiscated and turned into a Crown holding, but King Charles XI allowed the *magasin* system to continue. Over time, however, poor management by the Crown's administrators caused it to shrink more and more. Finally, during the 1760s, what little remained was converted into an ordinary parish *magasin*.

Although there is little reason to believe that this grain reserve system was widely adopted, a few examples can at least demonstrate that the idea was widely known. One such example is Altuna in Västmanland County. Following the poor harvests of the 1690s, Baron Creutz, the owner of a large estate, in 1698 willed 13 barrels of rye and 22 barrels of barley as the starting capital for a parish *magasin*.[5] There is surviving correspondence from 1700 between the Swedish Governor General of Livonia, Erik Dahlberg, and the King that deals with requests from the tenants of large Crown estates. Their primary wish was for longer tenancy agreements, but in passing they also offered to establish grain reserve systems for the peasantry. They intended to urge the peasants to contribute between 1/4 and ½ *lop* per *mantal*[6] to a grain reserve. It would be neither owned nor administered by the Crown tenant. Instead the peasants would participate in its management. The King responded that, at least for the time being, implementing this proposal would be difficult in view of the substantial contributions he was planning to impose to finance the wars that were looming.[7] Appearing at a number of *ting* meetings during 1699, the County Governor of Nyland and Tavastehus in present day Finland encouraged the peasantry to establish parish grain reserves. In a few cases, his suggestion was approved by the meeting, but no action followed.[8] In August of 1716 a Royal letter calling for the creation of grain reserves throughout the country was issued. It directed that storehouses were to be built and that three barrels of rye and one and a half barrel of oats per *mantal* were to be deposited in them for later disposal of the central power representatives.[9] This occurred following a period of disastrous military adventures, and the motive was no doubt to repair Sweden's severely depleted military capacity. The peasants were promised payment for their grain, but, given the existing monetary chaos, it is doubtful that they felt any great confidence that they would be justly compensated or their property rights respected. If anything, this episode probably created distrust of central government initiatives concerning grain reserves.

Clearly the concept of local grain reserve systems was nothing new. Moreover, it is likely that more such local reserves were established than the few of which we know. There is no reason, however, to believe that such systems were widespread.

The Age of Liberty

The break-up of the Swedish Baltic Empire became irreversible with the death of Charles XII in 1718. At the same time the Country's constitutional system was radically altered. The absolute monarchy was replaced by a dominant, estate based, Diet. While the power of the extremely wealthy upper nobility had been undermined by the *reduktion*, the lesser nobility gained great influence in the Estate of Nobility, the most important of the four parliamentary estates (Nobility, Clergy, Burghers, and Peasants) of the Diet. The Diet became the new political arena where military officers, civil servants, merchants, municipal officials and church leaders could vie for power and advancement. Numerous social issues were politicized, as they became the subject of intense debate in the numerous committees, commissions and deputations that sprang up under parliamentary auspices.

The question of parish grain reserves was well suited to such debate. The newly elected speaker of the Estate of Nobility, the *lantmarskalk,* Sven Lagerberg raised the matter before a parliamentary commission for economic affairs, the *kammar och ekonomi deputationen* in 1723. He proposed that storehouses be established "at numerous locations" and that they should be administered by "the residents of the area". The grain reserves stored there were to be jointly contributed by the local population as a group. It was emphasized in the proposal that these store houses, and their grain holdings, should be administered by trustworthy members of the parish, not by Royal officials. These provisions were apparently because the concept met strong resistance from the Peasant Estate. The Peasants raised a number of objections: they were too poor to contribute, there was a lack of suitable storage facilities and it would be difficult and expensive both to maintain the structures and to store the grain. Therefore, they argued, it would make more sense to rely on the grain stored in the Crown's warehouses. This latter proposal was referred to the government administrative boards, the *Kammarkollegium* and the *Statskontoret.* These, however, quickly responded that it was not possible to utilize grain belonging to the Crown. Concerning the possibility of the suggested non-governmental (parish) storehouses, they had no opinion.[10] While this brought an end to the discussion of the matter at this Diet session, it actually marked the beginning of a virtually endless debate of the core issue: should the Crown's responsibility for famine relief at least partly be transferred to the peasants themselves?

By the time the new constitution took effect, a long series of wars had reduced Swedish agriculture to a pitiful state. The Country could not be fed without an increasing level of imports. In response to this crisis, in 1725 a commission was appointed. In the parlance of the 18th century, where economy meant agriculture, it was called an "economy commission". The commission surveyed the county governors concerning possible initiatives in eleven different areas. One of these questions concerned parish *magasins.* The commission assumed that the

parishioners themselves would decide on the organizational form, would deposit surplus grain from good harvests and would have complete control over how the grain was to be utilized. Royal officials were to have no right whatsoever to interfere with the administration of the *magasins*. The county governors responded favourably but without enthusiasm. They also enumerated a number of obstacles to the plan. These were summarized in an internal commission document:

1. Without remuneration it would be difficult to recruit trustworthy and active administrators.
2. There was a shortage of suitable storage facilities.
3. Variation in grain quality could be a problem.
4. The volume stored would shrink due to drying and vermin.
5. Labour would be needed to shovel the grain.

The governors also noted that many nobles preferred to deal directly with their tenants, without outside interference, concerning these matters. A draft proposal submitted to the commission members outlined a policy that followed the "*example of Joseph*". The Crown was to purchase and store dried grain during the winter. Financing would be provided by the Regimental funds. In addition, the Crown should always collect taxes and fines in kind (i.e. grain) and not allow their conversion into money. Should these measures prove insufficient for the establishment of enough Crown grain storage, the peasants should be required jointly to deposit (make *sammanskott* of) two barrels of grain per *mantal* to parish *magasins*. It was envisaged that the tithe barns and the storehouses established by the inns would be used to actually store this grain. The draft proposal went into considerable detail. Thus it prescribed that the new storage facilities were to be built with double floors and with stones separating the layers. Court clerks (*häradsskrivare)* and church wardens (*kyrkvärdar*) were to take part in measuring out the grain. Each of them was to have a key to each of three different locks on the storage building. For their services they were to receive a fee.[11] None of this came to anything, however. The commission suddenly re-organized its work, and the whole issue of parish *magasin* vanished from its agenda.[12]

Meanwhile, another commission appointed in 1724 had been working on the reconstruction of Finland following the end of the Russian occupation. It took the initiative in establishing a parish *magasin* in Upper Satakunda *härad.*[13] A charter, that later became an important prototype, was drafted and approved by the King i.e. the State Council.[14,15] This particular *magasin,* however, failed to flourish and eventually disappeared.[16]

During virtually every Diet session of the 1730s and 1740s, demands were raised that the Crown should take greater initiative to stabilize the grain market. In 1731 proposals concerning government grain reserves intended to stabilize prices were presented by a Captain Sprengtporten and by Mayor Alm of the city of Karlshamn[17]. The Administrative Boards rejected these proposals on the grounds that the government lacked the necessary funds. They also turned down the suggestion that the regimental funds be used.[18] The State Council was clearly embarrassed by the negative response and urged the Boards to consider alternative ways to achieve the same objectives.[19] The Boards responded by pointing to the Satakunda charter

discussed above. On that basis the Parliamentary Commission then entered into an extended discussion of the document and how it might be revised. It was concluded that the contributions should be larger - ½ barrel rather than the 1/8 called for in the Finnish case. They agreed that the *magasins* and their contents should be at the sole disposal of the parishioners, that Crown officials should be excluded and that the grain should be exempt from seizure for debts, private or Crown. They suggested a rate of interest of 4 *kappar* per barrel (12.5% per annum).

The commission report contained a sentence that was to become controversial. In the draft the King was asked, "to order the county governors and appropriate Crown servants to assist in case someone in the parish is opposed to the implementation". It was, however obvious that such a clause would meet strong resistance with the Peasant's Estate.[20] In an additional comment they had to write that "in order to prevent all coercion" the condition "provided that they agree between themselves" should be included[21]. The King in Council issued the decisions of the Diet in a letter from the King to the county governors in December 1734 where the writings of the Diet were included almost verbatim and it was repeated that the decisions had be "voluntary" and that "nobody may be coerced".[22]

With a few exceptions, this decision and the King's letter clearly had little effect. Count Cederhielm, the dominant landlord in Orkesta Parish, had participated actively in the Parliamentary debates, and he responded by submitting a parish *magasin* charter that he had drafted to the Board for Public Lands and Funds.[23] While the Count certainly displayed a great deal of enthusiasm, there is no evidence that any practical consequences followed. The later records of the Orkesta Parish *magasin* indicate that it was established in 1758.

The County Governor of Östergötland was the only one to submit a report to the King concerning efforts made at the local *tings* (meetings of the *härads)* to establish *magasins*. He gave a detailed account of the difficulties encountered in persuading the peasantry. They presented a litany of concerns and objections. Many lacked a supply of timber with which to build storehouses or barns. Fears were expressed that disputes would arise concerning the calculation of the interest, or that the stored grain would be exposed to theft, fire or embezzlement by the administrators. In addition, it would be difficult to find anyone willing to assume responsibility for any disappearance caused by vermin or shrinkage. The Governor concluded by forwarding a plea from the peasants that they be "spared from the establishment of *magasins*".[24] The Council laid the letter ad Acta, with the laconic comment that the *magasins* were voluntary.[25]

At the 1738–39 session of the Diet, once again a proposal to stabilize grain prices was advanced, this time by a Captain Mannerheim[26]. Following the usual response that no funds were available and that *magasins* should be considered in place of Crown storage, the proposal was forwarded to the Board for Public Lands and Funds. The Board, in turn, forwarded it to the county governors for their comments. On basis of the responses, the Board, at the next Parliamentary session in 1740–41, reported that "almost everywhere in the Realm were barns of one kind or another close to the churches". These, the Board felt, could be used as *magasins*. If it was difficult to obtain grain deliveries, the parish could rely on church funds

that were usually lent at interest. As an example, the Board also noted that the county governor of Gotland reported entering into agreements with some parishes that they would deposit grain in storehouses.[27]

At the Diet meeting in 1746–47 proposals about Crown storehouses came back once again. This time they came from a baron Reuterholm[28] and as usual it was averted with reference to the parish *magasins*. But reference was also made to the poor results of previous efforts and now claims were made to make the establishment mandatory but none of the four estates were yet ripe for such a decision. It ended by a commission from the Diet to the Council to consult with the county governors and "depending on the circumstances in each place" handle the issue. The pressure from the Diet on the King in Council to act grew but the Diet was not yet ripe for any coercive action, which would have been resisted by the Peasantry Estate.

In 1749 Governor Falkenberg of Skaraborg County took the initiative of drafting a detailed charter for *härad magasin*. The proposal was presented anonymously, or at least without the Governor's official involvement. He had arranged for the consistory in the Diocese of Skara to forward it to the pastors, together with an admonition that they should try to convince the peasantry at the parish meeting. Falkenberg justified this roundabout procedure in a letter to the King where he expressed his conviction that "the common man has no faith" in any new institutions, but at least has some trust in the clergy.

In many respects Falkenberg's proposal resembled the Finnish charter that was discussed above and the Parliamentary motions of the 1730s. He had, however, added numerous detailed provisions. These included the process whereby grain would be sold, and the receipts deposited in an account with the county administration and under the surveillance of the governor, whenever the market rose above a specified level. Enclosed documents reveal that the governor succeeded in igniting a widespread discussion throughout the County. The concrete results, however, were meagre, with only a few parishes agreeing to the proposal outright. Most parishes wished to wait for the others to act. In his letter to the King Falkenberg indicated his belief that mandatory regulations would elicit loyal compliance. The Governor also urged the Crown to subsidize the construction of *magasins*.[29]

Falkenberg received a prompt reply from the King. Not surprisingly, the suggestion of Crown subsidies was rejected. As for his proposed charter for the *magasins*, the King in Council instead largely repeated the contents of the Finnish charter. Nothing was said concerning the Governor's detailed regulations. It was apparently felt that these would encourage unwelcome interference by the county governors that might create resistance from the peasants.[30]

By this time 27 years had passed since the Speaker of the Nobles, Sven Lagerberg, had first raised the issue in the Diet in 1723. Both the Parliamentary debates and the reports of the governors, however, make it clear that little of substance had occurred. A study, undertaken in 1832, reports that by 1749 ten parishes had established *magasin*.[31] Three of these were located in the province of Hälsingland and two in each Dalarna and Västmanland. This, however, is almost certainly an underestimate. Court records and the minutes of parish meetings

just from Västmanland in 1750 indicate that at least four additional parishes in that county had established *magasins* during, or prior to, the 1740s. This indicates that national government officials of the 1750s were unaware of the true extent of the on-going *magasin* activities. Still, there is no reason to believe that the *magasins* were truly widespread.

The Establishment of *Magasins* Gains Momentum

1750–74

In his proposal, Governor Falkenberg referred to the good harvest of 1749 in Skaraborg County, while in eastern Sweden the crops were rather poor that year. This variability, however, did not apply to 1750. That year, the entire country enjoyed bumper crops, among the best of the entire century. On August 7, according to the Julian calendar then in use, the King in Council ordered all county governors to take appropriate measures at the *häradsting* to convince the peasantry to establish *magasins*.[32] According to the Gregorian calendar that is in use today, the date of the order was August 18. Thus, the rye harvest was well underway, and the Council was probably aware of the favourable prospects, at least for that extremely important crop. Further good news came with excellent yields for the spring crops, barley and oats, as well. An example of the resulting joy was the Bishop of Västerås' instruction to all the Dioceses' pastors to hold a special service of thanksgiving, praising Almighty God for his goodness in thus blessing the Country.

The Royal letter argued that the bumper crops should be utilized to free the Crown of the need to provide relief for every little shortfall, which, in any case, it lacked the resources to do. The Finish *magasin* charter was enclosed as an example, but it was emphasized that the parishes were to be free to establish their own rules. That freedom included the rate of interest, although 5 *kappar* (slightly over 15%) was suggested. Moreover, the instructions specified that the capital contributions of the parishioners were to be exempt from all claims, private or public. The letter is almost verbatim the same as that sent to Governor Falkenberg in January. Clearly, most of it was simply copied from that earlier missive. One aspect, however, was new. Previous to Falkenberg's proposal, which referred to *härad magasins*, all discussion had concerned *parish magasins*. This latest Royal directive now called for *härad* or parish *magasins*.In a number of counties, the governors acted quickly. The governor of Uppsala County reported that he had summoned the peasantry to those winter *tings* that were located close to the city and that he had personally participated in the ensuing discussions. For the more distant *tings*, he had instructed the local district judges, the *häradshövdingar*, to present suitable proposals in the presence of the crown servants (bailiffs).[33]

Wasting no time, on the 13th of the same month Governor Fleetwood of

Södermanland County ordered the bailiffs to present the proposal to the tax collection meetings of the *häradsting*.[34] He reported that, in addition to writing the district judges, he had requested the consistory to encourage the pastors to do their part at their parish meetings. As if that was not enough, he also had summoned representatives of all the parishes in the southern part of the County to a meeting at his residence in Nyköping, while the northern representatives were summoned to the city of Mariefred. All were urged to commit their parishes to establishing *magasin*. In addition, the governor announced his intention of donating between 2 and 5 barrels of grain to the *magasin* in any parish where he personally owned land. He also claimed to have persuaded numerous nobles to do likewise. Unfortunately, the untimely death of the Governor interrupted his campaign to establish *magasin*.

From the island county of Gotland the governor reported that he had summoned representatives from all the parishes to a *häradsting* where he demanded that they commit their parishes to establish *magasin* and jointly contribute to them. From the court records it seems clear that the arm-twisting was severe. The word "obligation" appears much more frequently than "voluntary". The minutes of the southern *härad* report that one freeholder peasant from Hemse openly declared his aversion to making a contribution. Moreover, he prayed to God that He would protect him from any coercion that would follow his refusal. The judge, according to the minutes he himself had composed, admonished the peasant for speaking recklessly and warned him that he was risking very severe consequences. Following that exchange, a majority of the representatives committed their parishes to establishing *magasins*.[35] In most cases, however, the promised contributions did not materialize and few *magasin* were actually established at this time.

From many other counties the reports were not encouraging. Thus the governor of Älvsborg County wrote that the peasants protested that even in the best of years they had insufficient grain to allow for any contributions. In Kalmar County the peasants expressed their preference that the Crown paid for the stored grain. That is, they wanted the government to buy it from them. Nor was there any peasant interest in parish *magasins* in Skaraborg county despite, or perhaps because of, Governor Falkenberg's activism the previous year. The governor therefore reiterated his previous suggesting that the government subsidize the construction of *magasins*. From Örebro County the governor reported that the institution only had been accepted by two, albeit large, parishes, Mellösa and Fellingsbro. In Värmland, the area where he considered the need for parish *magasins* to be especially acute, there was no interest whatsoever. The governor of Stockholm County wrote that preparations for constructing *magasins* had been undertaken in a few parishes. He himself was cool towards the whole project, however, and announced that he would not endorse it.

The strongest interest was recorded in the counties of Västmanland and Kopparberg. In the former the bailiffs were promptly ordered to convince the parishes to establish *magasins*. The governor himself attended several *tings* during the fall. Also present were a number of non-noble, upper class persons (*ståndspersoner)* who, at least on some occasions, were armed with drafts of

magasin charters. These probably reflected groundwork laid by the governor. Already on September 20, at the fall *ting* in Norrbo, a draft charter adopted three weeks earlier by one of the parishes was presented in the presence of the governor. Proposed by Colonel Samuel Gustav Stierneld, it required a contribution of one *fjärding*[36] of grain per *öresland*.[37] Several upper class persons promised to contribute to the *magasin* once the charter had received Royal approval.[38]

At the regular fall *ting* in Skinnskatteberg, Iron Master Edman of the Bockhammar iron works presented a *magasin* agreement and charter that he had drafted at the behest of the parishioners of Gunnilbo[39]. Per Silander, another iron master, was in a more delicate situation. Rather than owning an iron works, he managed one. The owner, Count Fredrick Gyllenborg, was one of the most prominent, and unpleasant, leaders of the parliamentary Hat Party. Silander declared on behalf of his employer that while he had no objections he neither could promise any contribution. This frequently happened when major landowners were absent. When staying at their country residences, they were often the driving force, sometime for and sometimes against. When they were absent, often living far away, however, their local representatives had little authority, often causing the decision making process to stall. In Lundby parish, where the only major landowner was the Crown, Bailiff Törnros, representing the government, appeared at the parish meeting and pushed through a draft *magasin* charter, which he then signed.[40]

The governor of Dalecarlia (Kopparberg) County recounted that he had personally attended a large number of parish *tings* and convinced them to establish *magasins*. The parishes listed included Svärdsjö, Tuna, Leksand, Rättvik, Mora, Älvdalen, Orsa and Ore. Indeed, with two exceptions, the entire County had been persuaded. Failure was limited to the western part of the county close to the Norwegian border, where little grain was grown, and to a limited number of metal working parishes, such as Aspeboda, Vika, Torsång and Kopparberg, where some oats were grown for the horses but bread grains were imported.[41]

Perhaps not surprisingly, getting the peasants to actually deliver their quotas was a major problem. In this regard, timing was essential. Thus, for example, when deliveries had to be postponed for several years until a storehouse had been constructed, they could well be due in a poor year when there was no surplus grain available. Such a situation was obviously problematic. This kind of delay was not uncommon, particularly in areas where little timber was available. In other cases simple solutions were possible. In the many small parishes on Gotland there was often room for a grain bin in the church. This possibility was also frequently utilized in Skaraborg County, another area with many small parishes. In many other places, such as Uppland and Västmanland, there were abandoned Crown tithe barns that could be used.

When the *magasins* were discussed at the parliamentary session of 1752, praise was heaped on the "indefatigable sedulousness and praiseworthy zeal" of most county governors. The question was asked if an edict requiring all large parishes to establish a *magasin* would be helpful in convincing the peasantry. Clearly the parliamentary committee was thinking in terms of making the *magasins* mandatory. No such explicit

conclusion was drawn, however. Instead the committee proceeded to a discussion of possibly raising tariffs in order to support grain production in Scania.

As a result of the campaign pursued during the early 1750s, by 1755 nearly 160 parishes had established *magasins*. These were strongly concentrated in Västmanland and the Kopparberg counties, where most parishes participated, and, with two notable exceptions, in Uppsala County. These exceptions were the northern part of the county, which was dominated by forests and iron works, and along the northern shore of Lake Mälar not far from Stockholm, where the nobility owned large estates. *Magasins* also had been established by thirteen parishes in Södermanland and by a scattered handful in Hälsingland and Östergötland. In the case of Södermanland, these thirteen can be contrasted with the more than fifty parishes had committed themselves to instituting *magasins*. According to the county governor's report to Parliament, this shortfall was the result of delays in constructing storage facilities, together with intervening poor harvests.

At the parliamentary session of 1756, however, the attitude was less favourable. The Diet now informed the King that the objectives of the *magasin* program had not been achieved. Although it was understood that the state of the harvest played a role, and in many parts of Sweden that very year was exceptionally bad, the Council was asked to encourage the establishment of additional *magasins*. Distributing printed examples of *magasin* charters that had actually been adopted, it was felt, could help by spreading knowledge of how they should be administered.[42]

In February of the following year, the King in Council issued new instructions dealing with the establishment of parish *magasins* to all the county governors. Enclosed was a "manual" on the subject, authored by Jacob Larsson in Lidetorp, a member of the Peasant Estate. It consisted of two parts. The first was a revised version of a *magasin* charter from the parish Nysund in Örebro County, while the second included a set of accounting forms. These forms were intended to demonstrate how the *magasin* account books could be kept, not just to track debts and assets, but also to inform each participant of how compound interest was increasing his share of the total capital. The prototype charter included in the manual foresaw the possibility that the initial capital contributions might be refunded if and when the *magasin* had grown to more than twice its original size. The possibility that the shareowners might be required to take loans to prevent the grain from lying unproductive and suffering damage over the summer was also included. An obvious, but probably unintended, consequence of implementing such a rule would be that no grain stores were carried over from one year to the next, thus undermining the declared purpose of the entire institution.[43]

In 1755 and 1756 the harvests were poor and few new parish *magasins* were established. With the better crops of 1758 and 1759, however, the rate of establishment picked up substantially, especially in the counties of Södermanland, Gävleborg and Gotland. Many of these represented the implementation of commitments made in 1750. A few new *magasins* also appeared in Stockholm, Skaraborg, Jönköping and Älvsborg counties.

By 1760 more than 300 parishes nationwide had established *magasins*. During the next decade less than one third of that number was added. In the counties where there had been widespread introduction of *magasins* during the 1750s, the institution was so widespread that there was little room for further growth. Only one county, Skaraborg, witnessed an increase in the number of new *magasins*. The expansion of *magasins* in Skaraborg seems to have accelerated in 1761 when Governor Falkenberg was succeeded in office by a son of the same Sven Lagerberg who, as speaker of the Nobles, had taken the first initiative in the Parliament of 1723. In the 1760s 40 parishes established *magasins* compared to eight in the 1750s.

There is evidence that the county governors further increased the pressure on their parishes. They apparently wanted to demonstrate results and sometimes even went so far as to threaten penalties if *magasins* were not established. Such actions were clearly illegal, and the matter was raised by the Peasant Estate in the Diet. In 1765 the King in Council responded by reiterating that coercion was forbidden and pronounced the county governors' orders to create parish *magasins* under threat of penalties invalid.[44]

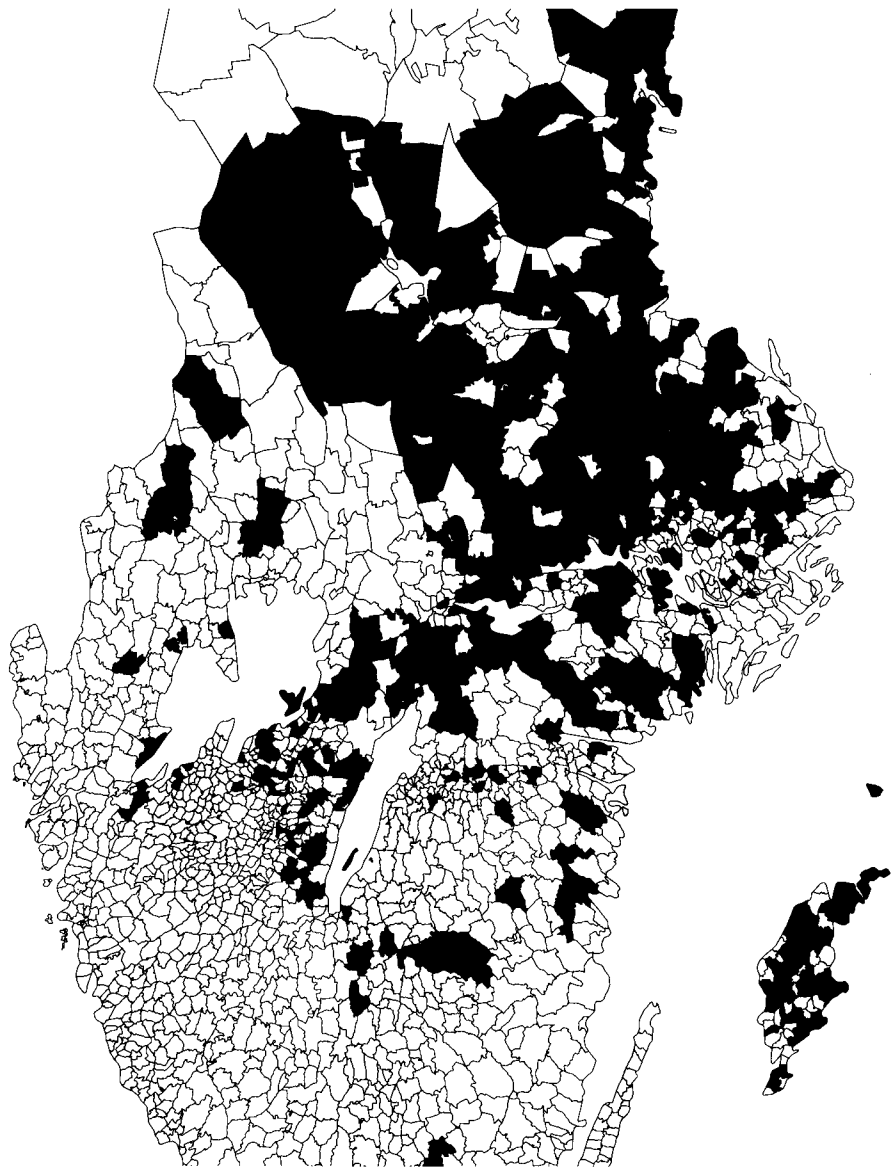
During the early 1770s Sweden experienced a serious harvest crisis that was exacerbated by similar conditions throughout large parts of northern Europe. As a result, little relief could be received from imports, and prices reached extremely high levels. Combined with epidemic diseases, the inevitable result was appallingly high mortality rates. Nevertheless, after a good harvest in 1773 new *magasins* continued to be established in some of the counties, such as Stockholm, Södermanland and Skaraborg, where the institution already was fairly widespread. The map 6.1, as well as table 6.1 below, display the total number of *magasins* that had been established by 1775.

Table 6.1

Number of Parishes with *Magasins* Established Prior to 1775 (by County)

County	Before 1750	1750-54	1755-59	1760-64	1765-69	1770-74	Total
Uppsala	0	34	9	1	3	3	50
Södermanlands	0	13	22	2	6	8	51
Västmanland	5	58	0	1	0	0	64
Kopparberg	2	25	4	1	0	0	32
Gävleborgs	4	5	23	3	1	1	37
Gotlands	2	1	47	7	3	1	61
Örebro	0	2	15	7	2	1	27
Stockholms	0	2	6	6	6	10	30
Östergötland	0	4	2	1	3	6	16
Skaraborgs	1	1	7	19	21	5	54
Jönköping	0	0	7	0	3	4	14
Älvsborg	0	0	6	0	0	0	6
Total	14	145	148	48	48	39	442

Note: The table is based on a list of all parishes with magasins that has been established as a basis for this study. In this list data regarding the parishes have been noted such as population, and data from 1832 contained in the inventory of the Agricultural Academy such as assets of the *magasins*, rate of interest charged and year of establishment. (See Archival Sources, KSLA). In a limited number of cases there has been information available regarding the date of the first establishment of a *magasin* in the parish (e.g. in contemporary reports from county governors) indicating that there was a *magasin* prior to the date stated in 1832. In such cases the list has been adjusted. The number of cases where such adjustments have been made is limited to a few percent of the total number of parishes. The information in the parish list has been used as data base for the maps, figures and tables.

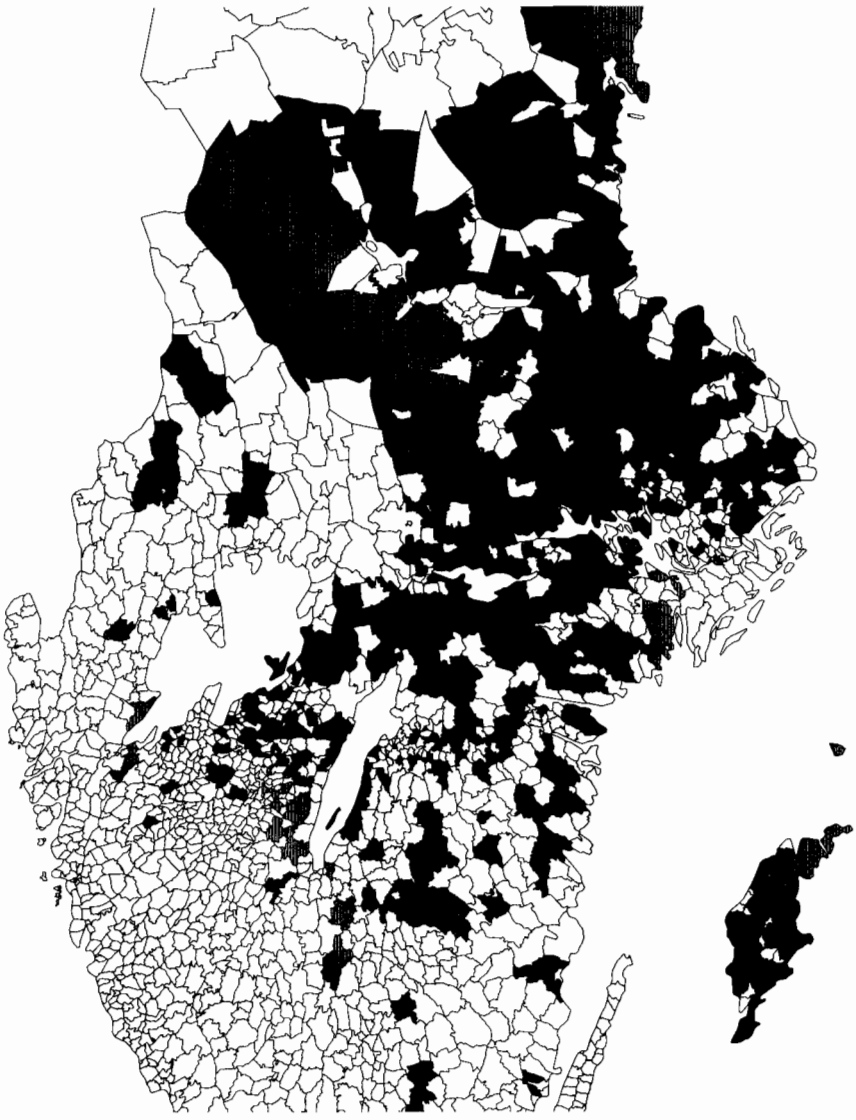


Map 6.1
Parishes with *Magasins* Established Prior to 1775

1775–1799

The impetus for *magasins* from the central government authorities had originated in the Diet. The *coup d'etat* orchestrated in 1772 by the new king, Gustav III, however, resulted in major constitutional changes. The power of the monarch was greatly enhanced, while the Diet lost its previous pre-eminent position. It was now longer possible for the deputies to engage in endless discussions of various policy options and ideas under the auspices of a plethora of committees and commissions. The Diet was no longer expected to participate in the details of government. Rather it simply was expected to approve and confirm Royal proposals. Executive decisions were now taken by the King personally on the basis of proposals submitted by the advisors he himself had chosen. The Mercantilism that had permeated the Age of Liberty was now replaced by a more physiocratic or liberal attitude. In the financial sphere, these new views were represented by Johan Liljencrantz. While participating in various commissions, he had argued that improved marketing conditions were the key to agricultural development. Thus, for example, in 1775 he was a driving force behind the proposal to follow in Turgot's French footsteps and abolish regulations that impeded the domestic trade in grains. He also played a role in establishing a state monopoly of the distilling of *brännvin*, the national intoxicant. This monopoly made the state the major purchaser of grain.

Not surprisingly, under the new regime pressure from the central government authorities for the creation of more parish *magasins* ceased. That, however, did not prevent at least some of the county governors from continuing their arm-twisting of the parishes. There was, however, a clear downward trend in the number of new *magasins*. The first part of the 1780s witnessed several years of crop failure. As a result, the national grain deficit increased substantially and imports peaked. At some point following these crisis years, however, agricultural production began to increase at a rate significantly higher than previously had been the case. The parishes that established *magasins* during the last quarter of the 18th century are highlighted on map 6.2. Apart from some minor clusters most new establishments are rather scattered and there is no clear pattern.

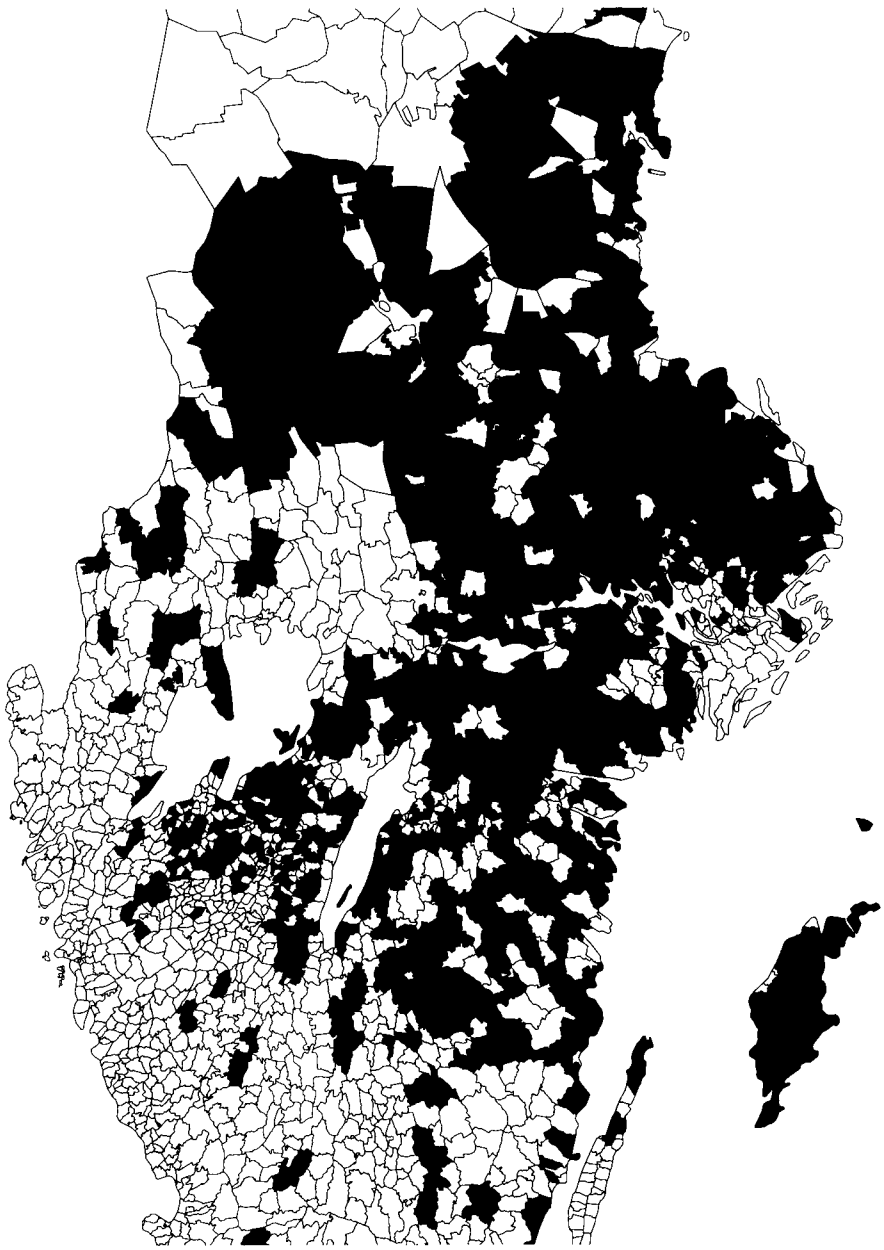


Map 6.2
Parishes with *Magasins* in 1800
(*Magasins* established after 1775 dark)

1800–

The minutes of an 1803 Cabinet meeting chaired by King Gustav IV Adolph included some extremely formal comments by the Monarch concerning the minutes of a previous, preparatory, meeting among his advisors. Since the paragraph in question was related to the matter of a parish *magasin*, the King, to the apparent surprise of all present, continued to hold forth on that institution. The discussion concluded with the King deciding to instruct the county governors to present the parishes with practical proposals demonstrating the usefulness and importance of *magasins* and to argue forcefully in their favour. The governors also were ordered to report on the *magasins* that existed in their county.[45] This was the first time since 1757 that the central government authorities at the National level had expressed any interest in the *magasins*. This new initiative had a significant impact in four counties, Östergötland, Värmland and the two Västergötland counties of Skaraborg and Älvsborg, where – with the exception of Skaraborg – *magasins* had been relatively scarce. During the next two years, when grain prices were declining from their previous high levels, approximately 90 parishes established *magasins*.

The period 1813–15 witnessed yet another wave of new *magasins*. An additional fifty were created, many in the previously *magasin* poor county of Kalmar. Most of these were located in the *härads* of Möre and Aspland. The *magasins* established during the first quarter of the 19th century are highlighted on Map 6.3. Since by the end of the 18th century, east central Sweden was already well supplied with *magasins*, most of the new ones were located in more peripheral areas.



Map 6.3
Parishes With *Magasins* in 1825
(*Magasins* established after 1800 dark)

The number of parishes that established *magasins* for the first time fell even further during the 1820s, despite the fact that this period witnessed a major, and more permanent, decline in grain prices. It was mainly a case of one new *magasin* here and one there, in counties where they were already rather common, and on local initiative. Such was the case in the counties of Uppsala, Södermanland, Gävleborg and Gotland. The largest number of new *magasins* appeared in Östergötland County and in Skaraborg and Älvsborg Counties in Västergötland. Clearly the institution was spreading beyond the nation's agricultural core, where it was already well represented, into the periphery, but it was a slow process.

Summary

The establishment and spread of *magasins* can be summarized as follows:
1. Starting in 1750, following several decades of largely unsuccessful efforts to induce the establishment of parish *magasins* during the first half of the 18th century, the institution was quickly and widely adopted in parts of eastern Sweden.
2. The process of establishing parish *magasins* started later, proceeded slower and attained less coverage in the southern and western sections of the Country.
3. In the southern and western most parts of the Country, virtually no parish *magasins* were established.
4. Some limited areas immediately west and south of Stockholm also failed to embrace the institution.
5. The rate at which new *magasins* were established fluctuated over time.

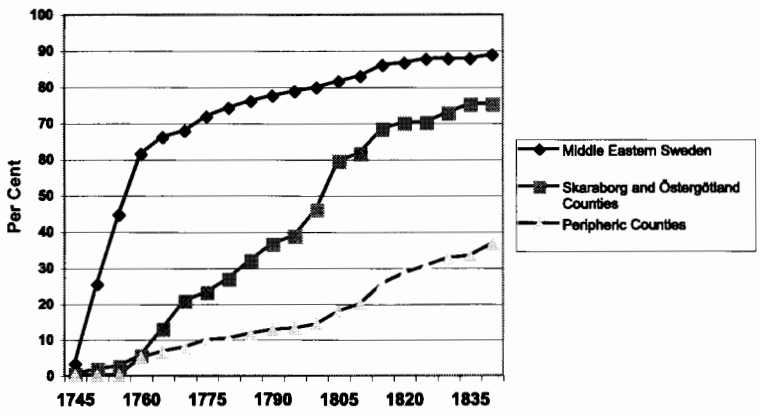


Figure 6.1

Percentage of Parishes with *Magasins*, 1749-1835 (by Region)

Note: In the group Middle Eastern Sweden the following counties are included: C, D, I, T, U, W and X. In the group Periphery Counties F, G, H, P and Y counties are included.

Source: Parish list. See Note Table 6.1.

Structure and Evolution

Structure

In the early 1830s there was a widespread discussion on the parish *magasins* all over the country. An official of the former General Grain Magazine Directorate (*allmänna magasinsdirektionen*) had in 1831 submitted a proposal to reorganize the parish *magasin* institution with the purpose to make it mandatory for the parishes to establish magasins in at least the 12 counties where the risks for harvest failure were considered to be most frequent. Another part of the proposal was that all inhabitants in the parish should become members and contribute to the initial capital.[46] The government asked each county governor to take advice from various experts and interests in their counties and report back. These reports give a broad survey of opinions but in one respect they were agreed and that was the lack of enthusiasm for or outright resistance against the proposal, which also meant that nothing more was done.[47]

In 1832 the government commissioned the county governors to collect detailed information on all *magasins* in their counties and the material was then forwarded to the Royal Academy of Agriculture to prepare an inventory of all the parish *magasins* in the Country. The result was a complete and detailed picture of the situation in that year.[48] The *magasins* had assets that amounted to a total of 168726 barrels of grain. Estimating annual grain consumption at two barrels per capita, this amount would have covered approximately 5% of Sweden's total requirements. The inventory revealed not only that the parish *magasins* were unevenly distributed across the Country, but that the differences in the level of their grain inventories (assets) were great, regardless of whether these were measured in total or in per capita amounts. With close to 2500 barrels, Stora Tuna in Dalecarlia was the parish with the largest quantity of *magasin* grain. At the other extreme, Ekeskog in Skaraborg County had a measly 11 barrels. Ten of the 25 best supplied parishes were in Dalecarlia, with an additional five in Gävleborg County, while seventeen of the 25 smallest grain stockpiles were to be found in Skaraborg County. Although not the entire explanation, this outcome was affected by the differing sizes of the parishes. Parishes in Gotland and Skaraborg were quite small, while those in Dalecarlia and Gävleborg tended to be rather large. Thus, it is clearly of interest to compare the assets (in terms of barrels of grain) of the parish *magasin* on a per capita basis.

What distinguishes high per capita asset parishes from those with low per capita assets? Parishes at various points along this scale have been studied. For this purpose three different per capita asset groupings have been utilized. These are the 100 highest, the 100 lowest and the 100 straddling the median. As shown in table 6.2, the Counties of Uppsala, Gävleborg and, to some extent, Gotland have an over representation of parishes in the highest per capita asset group, while the provinces of Västergötland (Skaraborg and Älvsborg Counties) and Småland

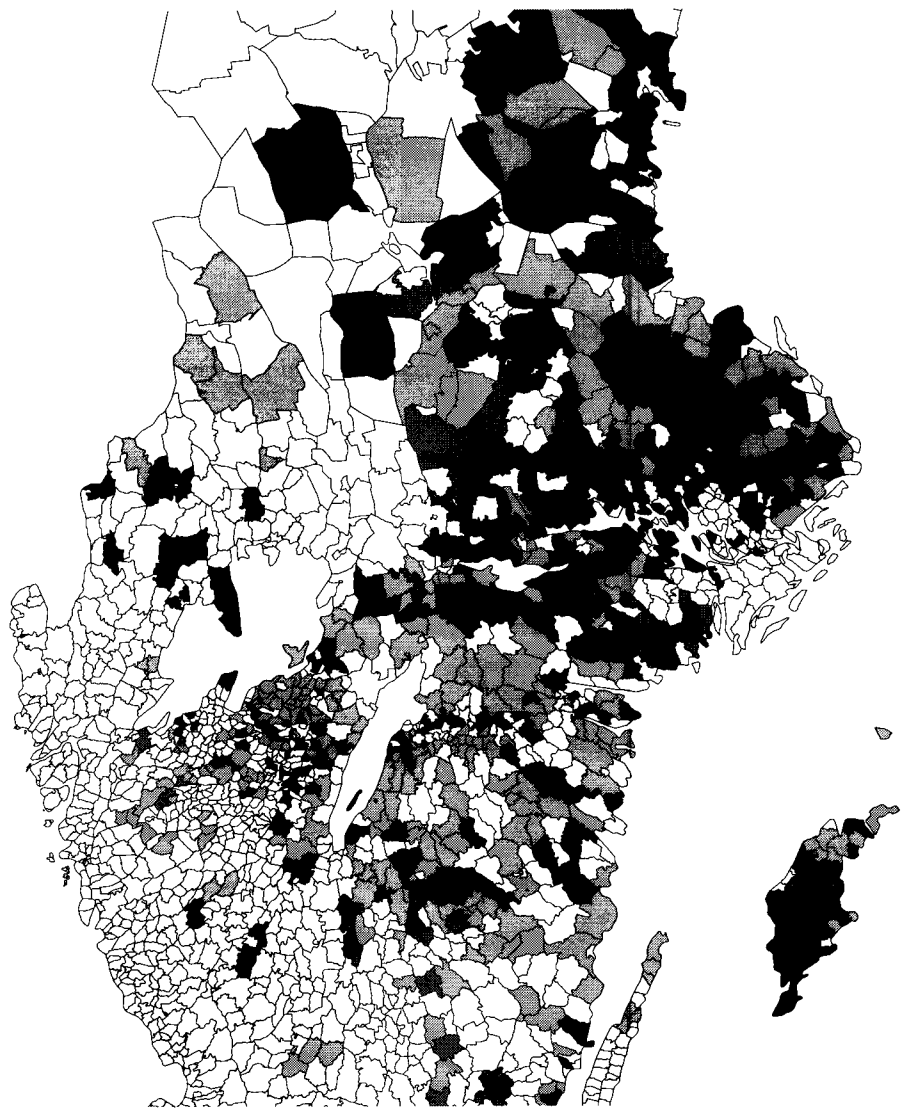
(Jönköping, Kronoberg and Kalmar Counties) contain a disproportionate number of low asset parishes. High per capita assets were associated with an early start. The median establishment year in the highest asset group was 1759, while it was 1804 for those with the smallest assets. In addition, the highest asset group of parishes has a lower median population. The percentage of so-called "noble" land (tax-exempt land, until 1789 reserved for the nobility), however, is essentially the same in the three groups.

Table 6.2
Number of Parishes with the Highest, Lowest and Median Straddling Per Capita Assets by County in 1832.

County	100 Highest	50 Above/Below Median	100 Lowest
Stockholm	8	9	2
Uppsala	31	2	1
Södermanland	7	13	0
Östergötland	6	10	10
Jönköping	1	10	12
Kronoberg	0	2	6
Kalmar	0	3	15
Gotland	11	13	0
Älvsborgs	0	2	8
Skaraborg	8	7	33
Värmland	6	3	5
Örebro	0	9	1
Västmanland	7	9	2
Kopparberg	5	1	3
Gävleborg	10	4	2
Västernorrland	0	3	1
Median values			
Inhabitants	608	1006	1109
Year of establishment	1759	1769	1804
Share nobility land %	24	26	31

Source: Parish list. See Note Table 6.1.

The uneven geographical distribution of parishes at the various asset levels is illustrated on map 6.4. Most parishes with high per capita assets are in Södermanland and north of it. There is a notable concentration of parishes with high per capita asset levels in the *härads* of, Hagunda and Ulleråker, all in the vicinity of Uppsala.



Map 6.4
Per Capita Assets in the Parish *Magasins* 1832.

Legend (Barrels of Grain Per Capita):

0.25– 0.1–0.25 0.01–0.1

Evolution

In order to study the evolution of the *magasins*, a sub-set of fifty parishes was selected. Whenever possible, their accounts were accessed every five years. By necessity, the first criterion for inclusion in this group of parishes was the availability of records for at least a part of the period covered. Beyond that, however, an attempt was made to achieve the widest possible diversity in terms of both geography and of social and economic conditions. While this effort had some degree of success, it cannot be claimed that this sub-set of parishes is representative in any statistical sense. This, of course, limits the extent to which it is possible to generalize the findings. Nevertheless, used with care, the results may still shed some light on the history of the parish *magasins* as an institution.

In any case, in terms of average population, the sub-set of parishes does not differ significantly from the entire group of parishes with *magasins*. The former's average assets per capita, however, is twice that of the latter group.

Table 6.3
The Sub-Set of 50 Parishes Compared with All Parishes Having *Magasins*

	Population in the parish		Magasin assets Barrels per inhabitant	
	Sample	All	Sample	All
1 Quartile	607	609	0.16	0.08
Median	845	968	0.28	0.14
3 Quartile	1405	1503	0.40	0.24

The median values of the available data is displayed in figure 6.2. It should be noted that the set of parishes is not exactly the same for every year. On occasion, a parish might drop out due to a lack of data. Except for the years between 1820 and 1825, the curve displays steady growth until 1835. That the early 1820s were an anomaly is hardly astonishing. Those years experienced major increases in the supply of grain and a corresponding decline in prices. The result may well have been a drop in the demand for loans from the *magasin*. The peak recorded for 1835 is likely to be an accurate reflection of the experience of both the typical *magasin* and the institution as a whole.

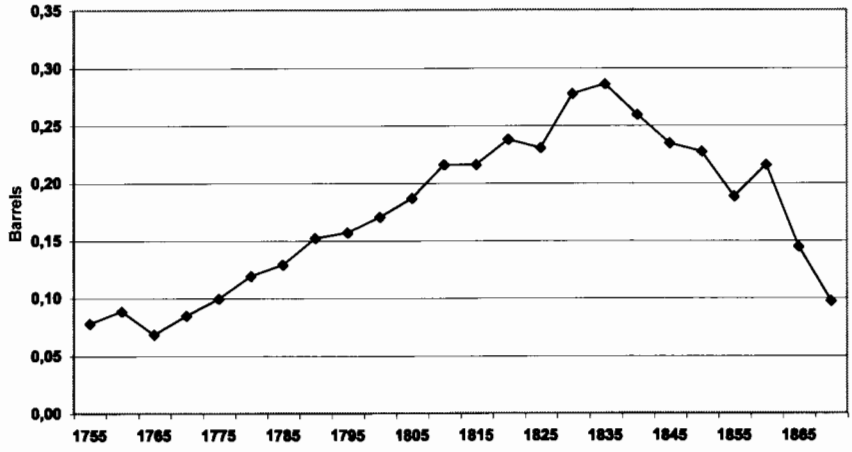


Figure 6.2
Median Per Capita Assets in the Sub-Group of Parish *Magasin*, 1755-1870

A remaining interesting question is the extent to which this sub-set curve reflects the trend in total parish *magasin* assets. It is not unreasonable to conjecture that the total curve peaked at about the same time as the sub-group curve. By then, the establishment of new *magasins* had virtually ceased. Indeed, after that date it is likely that more *magasin* were discontinued than started. That, in turn, would imply that the total curve probably declined even more steeply than does the sub-group curve. For the period before 1830 it is at least possible to combine the asset values from the sub-group with what is known about the establishment of new *magasin* to generate, if not an estimate, at least an arithmetic example. The result of this exercise is displayed in figure 6.3 below.

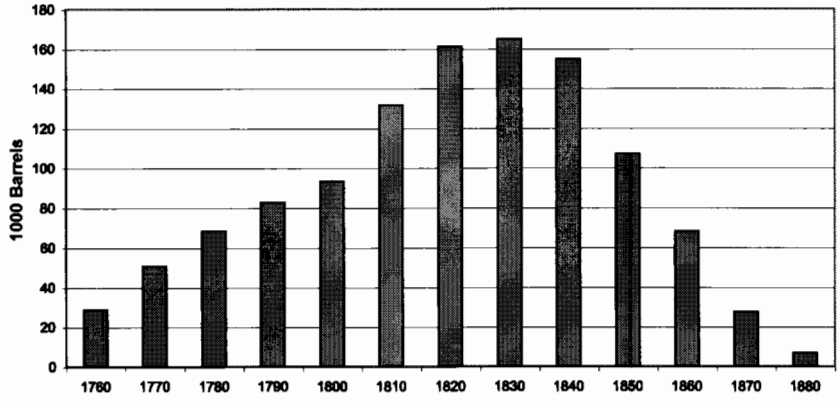


Figure 6.3
An Arithmetic Example of the Total Grain Holdings of Parish *Magasin*, 1760-1880 (barrels)

It is difficult to determine what happened to the *magasins* after the Royal Academy of Agriculture's second survey in 1842, which unfortunately was incomplete in certain parts. No more national surveys were undertaken. Moreover, at parish level the availability of records, such as account books, declines, perhaps reflecting reduced, or even completely discontinued, activity. The magnitudes displayed in figure 6.3 for the post 1840 years, therefore, are little more than guesses. The direction of the trend is clear, but the exact magnitudes are very uncertain.

During the early 1860s legislation created a new framework for Swedish local government. The old parish organization was now strictly limited to church related matters. Jurisdiction over poor relief, local schools and similar activities was transferred to the newly established communes, which, for the most part, were geographically identical to the parishes. In 1863 the parish *magasins* became subject of Parliamentary debate. It was argued that they had become redundant and that demand for their services had declined. The Parliament decided that the new communal councils (*kommunalstämmor*) should be empowered to decide the fate of the local *magasins*, and, if they were dissolved, to handle their assets in an appropriate manner. The general impression is that the on going institutional decline now accelerated. Only in rare cases did any *magasins* survive until World War I. It is apparent that by the 1870s the parish *magasins* had lost virtually all of their previous importance.

Footnotes

[1] Leijonhufvud (2002).
[2] The riksdrots was the highest ranking of the five High Officials of the Realm, ranking next to the King. His main responsibility was the judiciary system
[3] The records concerning Brahe and Visingsö are printed in Berg (1885).
[4] The *reduktion* was decided in 1680 to the effect that a large share of the land of the Nobles was taken back to the Crown.
[5] Altuna. CA, Ula.
[6] 1 *lop*= 4 *kappar* = 1/8 barrel; *Mantal* was originally the amount of land assumed by the tax administration to represent a typical farm. It remained the generally accepted size measure of farms from the 17th century until the mid 19th century, even though it could vary by location and over time
[7] Stiernman, (1766) p.835–37.
[8] Teerijoki (1987).
[9] Kongl. Maj:ts nådige påbud angående magaziners inrättande. (1716).
[10] R 2436; R 2437, RA.
[11] KK, Kansliet F VIII:32, RA.
[12] Brasch (2003).
[13] *Härad* was a district generally encompassing a number of parishes, which constituted a part of a county. For a further discussion, see chapter 8.
[14] During the Age of Liberty (1719–1772) the King had virtually no personal power. Executive power was exercised by the State Council. This institution is here used synonymously with the King in Council or, for this period, simply as the King.
[15] The charter is reprinted in Åmark (1915) p. 385–87.
[16] Teerijokki (1987).
[17] Sprengtporten's memo in R2557 p 552, RA; Alm's memo has not been found.
[18] Sammansarta kollegiers skrivelser till KM Vol 93, 2 november 1732, RA.
[19] Rådet, Inrikes Civil expeditionen AIa Vol 10, 24 november, RA.
[20] R 2612, RA.
[21] R 2611, RA.
[22] Rådet, inrikes / civil reg, 1750, B I A:42. RA
[23] KK, Första provinskontoret, 1736 års remisser, No 354, RA.
[24] Draft to letter from CG to KM. Östergötlands län, landskansliet, A II a Vol 51. Vala.
[25] KK till KM 1736, 26 mars Vol 119, RA.
[26] Mannerheims memorial. Enclosed copy. Landskansli. DI:49 Vila.
[27] One of these obviously was the parish of Buttle. See chapter 7.
[28] R 2912. RA.
[29] Letter from CG in Skaraborg to KM, 27 December 1749, RA.
[30] Rådet, Inrikes/civil, 1750, BI a: 42,. RA.
[31] All the data concerning the number of *magsins* established at various points in time is taken from a parish table compiled by the author. See note to table 6.1
[32] Rådet Inrikes /civil Reg. 1750 B I A: 42. RA.
[33] Letter from CG in Uppsala to KM, 31 May 1751. RA.
[34] The survey in this and following paragraphs of what happened in the various counties in 1750/1 is, if not otherwise indicated, based on the reports, which the county governors made to the Diet in 1751. R 3003, 3004 and 3005. RA.
[35] Södra häradet. Dombok, särskild serie. AI B2, AI EI. Vila.
[36] 1 *fjärding* =4 *kappar* = 1/8 of a barrel.
[37] 1 *öresland* = 3 *örtugsland* = approximately 3 acres, KLMN:II p. 458.
[38] Västmanlands län domböcker. Norrbo ting, 1750. Ula.
[39] Västmanlands län domböcker. Skinnskattebergs ting, 1750. Ula.
[40] Lundby CA, Ula.
[41] Letters from the CG in Kopparberg to KM 10 January and 7 February 1751. RA.

[42] R 4970 Rikets ständers skrivelse till KM 5 juli 1756.
[43] Modée VI p. 4576.
[44] Modée, VIII, p. 431.
[45] Konseljprot. Inrikes /civil ärenden A 4 aa:36 p. 491, RA.
[46] Handlingar rörande inrättandet af socken- eller districts-magazin. (1833)
[47] Statskontoret. Kungl. remisser D:aa.
[48] Inkomna uppgifter rörande sockenmagasinen. E IV: c. KSLA.

CHAPTER VII

How Did the *Magasins* Function?

The presentation of the *magasins* in the previous chapter was based on information from "above". The principal sources were the records of the State Council, the Diet, the county governors and the Agricultural Academy. These, of course, are necessary, but not sufficient, for a full understanding of how the *magasins* functioned. Summary statistics for the institution, however, cannot be used for the simple reason that they barely exist. In fact, the only such statistics available are contained in the Agricultural Academy's surveys of 1832 and 1842. It is, of course, the case that qualitative statements concerning the *magasins* are available from various types of records, debates and pamphlets. In addition to being very general and based on limited practical experience of the institution, however, such commentary usually is intended to serve a particular political purpose. Thus, the only route open to a fuller understanding of the *magasins* is a detailed micro approach. That is to study the development and operations of a limited number of individual *magasins* in the greatest possible detail. Nonetheless, before turning to individual cases, some common features of the *magasins* will be outlined.

Some Common Characteristics of the *Magasins*

Describing some of the characteristics that most, although not all, parish *magasins* had in common should help the reader to understand the individual cases to follow. It was standard practice for the *magasins* to have a charter (*reglemente)* which contained regulations concerning its status and operations. Thus they might specify that Crown officials were not allowed to interfere with the management and that no liens, private or governmental, could be placed on the *magasin* assets, as well as rules for how loans and repayments were to be handled and interest rates determined. The duties of the managers might be described in detail, and the purposes to which any surplus was to be devoted might be indicated. Almost all the charters I have read vary in their wording, indicating that they were locally authored. The basic content and substance of most of them, however, are still astonishingly similar to the pattern established either in the Royal letter in 1734, the sample (Finnish) charter that accompanied the Royal circular of 1750 or the Nysund Parish charter that was incorporated into the "handbook" distributed in 1757.[1]

In accord with the basic policy that each parish was entitled to decide for itself if it wanted a *magasin* and, if so, how it was to operate, no national legislation on the subject was ever enacted. The practice of granting royal approval of the charters (*stadfästelse*), however, endowed them with a formal legal status that was valued highly by the actors. In parish minutes, especially when they record disagreements, there are frequent references to the "Royally approved" charter. Clearly, the Royal imprimatur increased the institutional legitimacy of the charters. In some counties, the governor issued the approval, while in other counties he forwarded a draft to the king together with a recommendation for its approval. Although there were instances of clerks in the royal chancery adding amendments, approval of a charter was usually considered a formality. A probably unique exception of central government interference was when the county Governor on Gotland in 1814 drafted a prototype charter for the *magasins* in the county, which he also got approved by the King in Council. He then was to use this to expand his influence over the decisions in the parishes.

The procedure described above related to the type of *magasins* that officially were referred to as *sockenmagasin*. Generally speaking, all the owners of some *mantal* unit (ranging from a fraction to several) in the parish joined together to form a *sammanskott*. All would then contribute to an initial capital fund in proportion to the value of their *mantal* holdings. It is unclear whether an individual could refuse to participate. One royal directive can be interpreted to mean that, while a parish was free not to establish a *magasin*, once the parish meeting had decided to do so, participation was compulsory[2]. Examples exist both of individual *mantal* owners failing to participate and of complaints that coercion was employed to compel membership and payment. In parishes with numerous crofters these were sometimes forced to contribute even though they did own or cultivate any *mantal* unit. The crofters were not permitted to participate in the parish meetings and were utterly dependent on the owner of the land, for whom they also performed day labour. Moreover, these large landowners often controlled a majority of the parish meeting votes (see chapter 8). The collectives of parishioners and of owners of shares of the *magasin* could thus differ but such differences seem unimportant and for most practical purposes they do not seem to have caused any problems. The parish meeting was generally the body with the ultimate say in *magasin* issues. Sometimes the parish meeting appointed a *magasin direktion* (board of directors) among some of the leading personalities in the parish to directly oversee the manager and current decisions.

In what follows no distinctions will usually be made among the numerous types of *magasin* that could co-exist in a single parish. In addition to the parish *magasin*, there might, for example, be a poor relief *magasin* (fattigmagasin), a School *magasins*, a Church *magasin* and a Disability *magasin*. It is difficult to discern any clear differences in the functioning of these various *magasins*. Rather, the distinctions lay in their origin and in the purposes to which their profits were dedicated. The *magasins* with such labels usually owed their establishment to donations from large landowners or clergymen. Sometimes the funds came from the accumulated interest of a parish *magasin* as an alternative to paying out

dividends to the shareowners. Thus, for a poor relief *magasin*, it would usually be prescribed that future interest income would be devoted to helping the parish poor. The additional possibility, that these *magasins* could serve as a reserve in case crisis relief was needed, was not explicitly stated. These special purpose *magasins* thus operated with a clear profit motive. Even if their charters specified that they were intended to assist the poor, they did not act differently from the regular parish *magasins*. Only some minor differences ever existed among the various *magasins* in a given parish. In a few cases, they charged different interest rates but in such cases there are no indication that charity should have been the motive. Examples also exist where the special purpose *magasins* were given priority when the total loan capacity of the parish exceeded the demand for such credits. These differences, however, are sufficiently small, and rare, to permit the various types of *magasins* to be grouped together. Thus, they will all be dealt with under the collective label of parish *magasins*. This is also what the Agricultural Academy did in its survey.

The grain storage facilities utilized varied widely. As noted in the previous chapter, a convenient alternative for a newly established *magasin* was to make use of a Crown tithe barn (*tiondebod).* These, however, were not universally available. An obvious alternative was to erect a new building. In parishes with access to timber the parishioners might each be assigned a quota of logs proportional to their *mantal* holdings. In such areas, a joint delivery of timber by the parishioners was sometimes ordered by the parish meeting to meet the needs of church, parish house and vicarage construction and maintenance. In lightly forested areas however, problems could arise. If limestone was available, an, albeit more expensive, stone structure might be built. In small parishes, such as those common on Gotland and in Skaraborg County, part of the church itself might be used. Thus, one or two grain bins might be placed, for example, in the tower chamber. For the two counties of Stockholm and Gotland surveys of the surviving *magasin* buildings are available.[3]

The managers of the *magasins* had varying backgrounds. Both Bergström (1991) and Teerijokki (1993) have tried to overview the social position of the people that acted as managers of the *magasins*. Sometimes, but far from always, they can be identified in the minutes or the accounts and when such names have appeared during the work they have been noted. Although the results are different they agree that those participating in the management represent a wide distribution of different kinds of people among those who had a respected social standing in the parishes. Crofters, craftsmen or day labourers were unthinkable. One important aspect when electing officials was of course their ability to write and to keep accounts. The material from Finland shows a much stronger proportion of people with a crown background as civil or military staff, while the peasants are more dominant in the material from Uppland. Peasants elected for such posts had often distinguished high social ranking titles like e.g. churchwarden.

Table 7.1
Social Background of *Magasin* Managers. Per Cent.

	Bergström	Teerijokki
Clergy	20	26
Civil servants	3	35
Military background	7	17
Peasants	45	11
Number of names	(29)	(316)

Sources: Bergström (1991) and Teerijoki (1993)

The financial material consists principally of the annual debt rolls. These contain a listing of all borrowers, together with their loans and, at least sometimes, their interest and amortization payments. In some cases a summary of annual income, expenditures and assets is included. When such summary figures are available for a number of consecutive years, it is possible to construct a series of simple balance sheets. The following presentation is largely based on such series.

An administrative weakness in many parishes seems to have been a lack of determination in collecting outstanding debts. As long as a borrower paid his interest and maintained his credit worthiness, it was actually very convenient for the *magasin* managers simply to let the loan roll over. If the borrower encountered difficulties and became unable to pay, however, a problem arose. To initiate collection procedures against a neighbour, perhaps with the, perfectly legal, assistance of the constable (*länsman)* or bailiff, was naturally very unpleasant. As a result, managers frequently delayed such action until it was too late. Bad debts resulting from a failure to pay were not uncommon. In the long-term and relative to the *magasin's* total assets, however, these losses seem to have been rather modest. Still, there are examples of disputes that ended up in the local *(ting)* courts. In the 1820s the county governor on Gotland obliged the parishes to report all loans older than two years in order to commission the bailiff to take legal action. This, however, seems to have been a unique practice.

One reason for the limited losses was that borrowers, who were not shareowners in the *magasin*, were required to provide a personal surety from two other persons. In the case of estate tenants and crofters, a guarantee from the landowner was required. The conclusion that losses were modest, however, requires a caveat since it is based on my impressions from a number of accounts of long-lived *magasins* whose records have survived. Many *magasins* might well have been less well administered, and there is reason to believe that the preservation of records was positively correlated with careful book keeping and strict collection procedures.

Another trait common to most parishes was the existence of one or more funds (*kassor)* dedicated to some social purpose. There had been church funds since medieval times, but by the 17th and early 18th centuries their assets were very modest. Toward the end of the 18th century the so-called poor relief funds, through which aid to the poor was channelled, became widespread. Initially their assets, like those of their church counterparts, were usually very limited. Starting at about the same time, and especially during the second and third decades of the 19th century, grain sales from the various types of *magasins* became common. For those designated

as parish *magasins* a special parish *magasin* fund was established to receive the proceeds of these grain sales. Part of these revenues were used either to pay for various general parish needs or for purposes related to the *magasin*. Another portion was often retained by the fund and then used for interest bearing loans. Similarly grain sale proceeds from the poor relief *magasin* flowed into the poor relief fund. Even a small parish could in this way have a number of institutions, each with its own assets and "balance sheet", denominated sometimes in rye, sometimes in barley and sometimes in money. To get a full understanding of the financial development in the parish it may be necessary to make a consolidated balance sheet since there were often flows between the various units with lending, borrowing, outgoing payments for services and ingoing ones for grain sales.

Searching the archives for the "typical" *magasin* to intensively study is hopeless simply because the characteristics of such an ideal *magasin* are unknown. Thus, it is necessary to approach the question from the opposite direction. Initially some cases are examined, despite the fact that they are known to be statistically unrepresentative. Two such parishes, both of which were successful in that their assets per inhabitant greatly exceeded that of the average *magasin*, have been selected. They will be described in as great detail as the sources permit. This procedure should make it possible to determine not only what they did, but also how and why they did it. They will also be compared with each other. What did they have in common and how did they differ? A further step will be to compare them with some other parish *magasins* that had smaller assets and consequently operated at a more limited, and more typical, levels. Hopefully, doing so will result in a more detailed and richly nuanced picture. Nonetheless, it is clear that this approach will not result in statistically significant, quantitative generalizations.

The sources for this analysis consist of the financial accounts of the parish *magasins* and funds, the minutes of parish meetings and court proceedings and notes from grain sales, as well as the charters (*reglemente*) containing the basic rules of the *magasin*. This material can be considered reliable, at least in the sense that it is not tendentious or biased. Its quality in terms of legibility and accuracy of detail (e.g. names, locations and amounts), however, varies. Still, the greatest problem is that it is incomplete and difficult to size up. Records are only available from a fraction of the 989 *magasins* that were included in the 1832 inventory. Furthermore, where records do exist, they often refer only to one or a handful of years, thus making detailed long-run studies impossible. The surviving records that do exist are mainly stored in the so-called Church Archives (CA) that form a part of the national system of regional archives (*landsarkiv*). The archives in Uppsala (Ula) and Visby (Vila) respectively contain the source records of the four parishes that will be presented later in this chapter.

Atlingbo and Balingsta

Inevitably, the first criterion for choosing a parish for intensive study is the survival of sufficient source material. Two of the parishes with the largest assets per inhabitant in 1832 pass this test. They are Balingsta in Uppsala County and Atlingbo on the island (and County) of Gotland. They had both similarities and differences. Both were on the small side compared to other parishes in their respective county and were independent *pastorat*, not grouped together with other parishes.[4] They were also consistorial (*konsistoriella*),[5] meaning that their pastor was chosen by the parish assembly. Geographically they were located approximately 20 kilometres from their county seat, Uppsala and Visby respectively. The landscape was reasonably open and their fields had been cultivated for at least 1000 years, principally for grain. The cultivation system was a three-year rotation with rye and barley being the dominant crops (winter rye – spring barley – fallow – winter rye and so on).

Table 7.2
Atlingbo and Balingsta: Some Key Characteristics

Variabel	Atlingbo	Median Gotland County	Balingsta	Median Uppsala County
Population 1830	186	330	479	703
Mantal/parish	11.7	11.7	38.4	36
Mantal/inhabitant	0.06	0.03	0.08	0.05
Per cent nobility owned	0	0	52	43
Per cent freeholder land 1850	95	96	24	39
Magasin assets per inhabitant 1832, barrels	0.54	0.19	1.53	0.27

Sources: Hammar (1860) and KSLA

In terms of land ownership, however, the two parishes differed greatly. In Atlingbo, all the land was freehold (*skatte*), with the single exception of the vicarage, which was Crown land. By contrast, in Balingsta much of the land was owned by nobles. The Wijk estate, with is demesne of three *mantal* and a further 11 *mantals* of tenant land, dominated the parish. Only 24% of the Balingsta land was freehold. The managers of the *magasin* had varying backgrounds. In both Atlingbo and Balingsta the pastor, at least initially, was a driving force behind the *magasins*. In Atlingbo, he also handled the book keeping initially. In 1814 the management was transferred to a peasant who had served as an army sergeant. The latter then filled his position until 1851. In Balingsta the pastor apparently had been the key supporter of the *magasin*, while his assistant vicar (*komminister*) supplemented his income by serving as manager.

Another important difference between the two parishes concerns the size of the units of cultivation. Measured in *mantal* these were much larger in Balingsta than in Atlingbo. Although the *mantal* concept was not well defined, neither in terms of area nor of output, it is the only measure available. It also was accepted within the parishes as the appropriate unit for allocating financial burdens.[6] While most of the land in Balingsta was cultivated in units of at least 1 *mantal*,

that in Atlingbo was mostly divided into units no larger than ½ *mantal.* It is noteworthy than in both cases this structure remained quite stable during the entire period studied. There is no evidence of farm sub-division in either.

Table 7.3
The Structure of Cultivation Units in Atlingbo and Balingsta

	ATLINGBO					BALINGSTA			
Number of farmstead units									
Mantal	1785	1815	1830	1845	1860	1815	1830	1845	1860
>2	0	0	0	0	0	6	4	3	7
1-1.99	1	2	1	0	1	11	13	16	15
0.75-0.99	3	2	1	2	1	9	5	4	3
0.5-0.749	8	5	5	6	7	11	13	7	6
0.25-0.499	8	12	17	16	13	4	3	5	3
< 0.249	2	5	10	10	12	2	0	0	0
Share of total mantal %									
>2						37	30	26	39
1-1.99	11	19	11	0	9	28	38	51	43
0.75-0.99	21	13	7	16	7	17	11	8	6
0.5-0.749	41	26	23	28	33	14	19	10	9
0.25-0.499	24	33	46	43	34	2	3	4	3
< 0.249	3	8	12	12	17	1	0	0	0

Source: Länsräkenskaperna, Västmanlands län and Gotlands län. RA

The Development of the Atlingbo and Balingsta Magasins

Atlingbo

The earliest history of the *magasins* in Atlingbo is murky. There are surviving notes from the Gotland County Chancery that imply the existence of a draft charter for a *magasin* in Atlingbo that was to be submitted for approval in 1759. No such document, however, has been located, nor are there any other documents that indicate what, if anything, happened at that time. What is known for certain, based on the financial records (*räkenskapsbok*) of the parish's church *magasin*, is that the former pastor Petrus Snöbom, who in 1762 had left for a more lucrative position in the larger parish of Wall, donated five barrels of rye as initial capital for a church *magasin*. With the help of compound interest at an annual rate of 12.5%, this capital had grown to 19 barrels by 1778. In that same year the harvest was unusually good, resulting in market scale lower than any during the previous ten years. Not surprisingly, there was no demand for new loans from the church *magasin* and all outstanding loans were repaid. If the grain in the magasin storehouse remained there, it might be ruined during the following summer. The pastor therefore had a "friendly discussion" with the parishioners at their meeting on May 10, 1779. He urged each peasant to withdraw "the raw and not dried rye that was

in the *magasin* as he pleased and in the autumn at Andrea (late November) return dry and acceptably clean, fully ripened and well shaped (*strid like fast)* grain".

A grain surplus year was the perfect time to establish a parish *magasin* to complement the church *magasin*. The opportunity cost of the grain the parish members would contribute to the parish *magasin* could not be lower. The parishioners agreed to contribute 2 barrels per *mantal*, which resulted in an initial capital of 19 barrels of rye. During the early 1780s there were several years of grain shortage, accompanied by a strong demand for loans from the new parish *magasin*. Its assets doubled over a five-year period. In 1785, however, following a very good harvest, loan demand suddenly plummeted and only half the available grain was lent. The parishioners reacted by donating some of the grain to the poor and awarding themselves a dividend. During the rest of 1780 the demand for loans recovered and both *magasins* continued to expand.

The growth of the Atlingbo *magasins* was concentrated into two periods, 1778–1789 and 1800–11, while the 1790s were a time of stagnation. During that latter decade the lending capacity of the church *magasin* was fully utilized in only five out of ten years. The amount of grain remaining, however, was reduced by sales. The parish *magasin* contracted through dividend payments to the shareowners. During the first decade of the 19th century the demand for loans revived and consequently the *magasins* expanded rapidly. The aggregate grain holdings of the two *magasins* peaked at 175 barrels in 1811.

In 1814, at the urging of the Gotland county governor, a new charter for the parish *magasin* was adopted in conformity with the governor's, royally approved, prototype for all *magasins* on Gotland. This charter specified that there could only be one *magasin* in each parish. At the same time the parish meeting also established a barley fund as part of the newly merged *magasin*. The rules established a goal of 100 barrels of grain for the *magasin*, substantially less than the 155 barrels recorded for that year. Consequently, large quantities of grain were sold from the church *magasin*, now treated as a church sub-division within the parish *magasin*. The revenue from these sales was added to the general church fund (*kyrkokassan)*, which started to grow rapidly. By contrast, the pre-existing parish *magasin* shrank as a result of numerous dividend payments, some of which, however, were returned to form the initial capital for the new barley fund within the parish *magasin*. Moreover, some major loans were repaid in money, laying the foundation for a new *magasin* fund (*magasinskassa).*

Over the course of several years, such readjustments reduced the total *magasin* assets to the targeted 100 barrel level. It then was maintained there until 1862. The procedure was to use the account balance in late fall, after interest and amortization had been paid, to determine how much grain should be auctioned the following spring. Thus sales and new lending from the *magasin* often coincided in April. This allowed parishioners who needed grain to choose between buying and borrowing.

The records provide no explanation to why 100 barrels was chosen, rather then the much higher level that existed at the time. It is only possible to speculate. Atlingbo had no special storage building. Instead the grain was stored in the small church, which had a very limited capacity. This could cause a problem if

all the loans were repaid at one time. As noted, during the first decade of the 19th century, the demand for loans was strong and there was very little repayment. All incoming interest and amortization payments, therefore, were re-lent the following spring. The result was the rapid growth, which culminated in 1811. There may have been an understanding among the parishioners that such a level could not permanently be maintained.

The records also are silent concerning the motives for the major post-1862 contraction. The minutes of the parish meetings, however, do contain records of several discussions of how the parish should react to the new local government legislation, that was decided in Sweden that year. The new institutional forms of local self-government that were being implemented had a profound impact on the *magasins* and the local funds (see chapter 8).

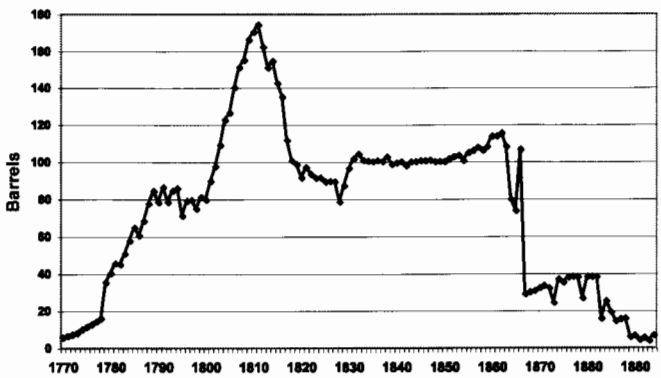


Figure 7.1
Total Assets of the Atlingbo *Magasins*, 1769–1894.
(Barrels of Grain)

Balingsta

The parish *magasin* in Balingsta was established in 1758, its charter having been approved by the king that same year following an application from the county governor of Uppsala. No financial accounts or other records pre-dating 1805, however, have been preserved. During the entire 18th century there is not a single mention of the *magasin* in the minutes of the parish meetings. There are a few references to a *magasin* for "poverty grain" and some poverty grain accounts exist from the 1790s. These amounted to 80 barrels in 1795 and 100 barrels in 1800. Initially the poverty grain was administered separately, but it was then merged with the parish *magasin* and listed as one of the funds on the capital side of the balance sheet. The origin of the "poverty grain" seems to have been a single barrel of grain donated by a peasant in 1778. He had requested that the barrel be invested in the parish *magasin* and be allowed to "develop at an agreed upon rate of interest". The practice in Balingsta was to combine the various *magasins* into one administrative unit with a single set of accounts, but with a capital

section of the balance sheet divided into various funds (e.g. poor relief or church maintenance). Pastor Åhlenius, who was appointed in 1804, was a strong advocate of local education, and he donated 64 barrels of grain for a new education fund. The profits of this fund were to be used for school construction, the salary of a teacher and other educational needs. A few years later Åhlenius instituted yet another fund, this time for the disabled. A remarkable new feature of the Balingsta *magasin* was that private individuals could invest (grain) in them. They were guaranteed a return of 4 *kappar* (12.5%) per barrel if they lived in the parish, 3.4 *kappar* if they lived elsewhere. This system was the subject of heated debate in Uppsala. The new pastor's various initiatives caused the assets of the merged *magasin* to grow very rapidly, thus serving a number of interests both public and private.

At the funeral of Åhlenius, by then promoted to Dean, the eulogy was given by Archdeacon Bergström from Uppsala. Given the latter's importance, the speech was printed and, therefore, has been preserved. Bergström described Åhlenius as a man of drive and determination, and he defended Åhlenius against charges that he had devoted too much of his attention to material and pecuniary matters. According to the Archdeacon, it was safe to say that "the clergyman [who] as far as his power reach [does] not work for men's earthly circumstances has not yet understood the whole importance of his heavenly profession".[7] It is also clear that Åhlenius did not limit his efforts to parish business. Indeed, he did quite well for himself. The probate inventory of his estate listed substantial assets, including debts from private individuals totalling 16000 *Riksdaler* in "good", and 6000 in "bad", promissory notes. In addition to being a reformer of the parish economy, he obviously was one of the most active and wealthiest moneylenders in the area. Whether or not this activity falls within the scope of the "heavenly profession", however, is less clear.

Starting in 1806 it becomes possible to follow the detailed development of the *magasin* using its financial accounts. Rapid growth in the early years culminated during the period 1810–16. After an ensuing decline it then remained at its new size until the late 1850s. During the 1860s there was a fairly rapid contraction that continued as long as the accounts are available.

Figure 7.2
Magasin Assets in Balingsta, 1806-1876. (Barrels of Grain)

The Loan Structure

Loans from the *magasin* were issued in the spring, usually during the second half of April. Sometimes lending would continue past that date if grain remained available. Loan requests generally had to be submitted in advance so that the manager could prioritize in case demand exceeded the grain available. Repayments were made in December, when threshing was complete or nearly over. The dates for taking loans and making payments were announced from the pulpit.

In making comparisons between the two parishes, it makes more sense to consider per capita, rather than total, assets. The most practical population figures to use are those of 1830, since they allow the results of the Agricultural Academy's inventory to be made comparable. The total grain assets per inhabitant in the two parishes is displayed in table 7.4.

Table 7.4

Lending per Inhabitant: Atlingbo and Balingsta

Barrels per inhabitant	1785	1815	1830	1845	1860
Balingsta		1.64	1.43	1.19	0.76
Atlingbo	0.19	0.77	0.52	0.54	0.61

Compared with other parishes in the Agricultural Academy's inventory, these values are very high. This result can at least partly be explained by the practice in these two parishes of lending substantial amounts to non-parish residents. Table 7.5 demonstrates this effect by dividing the loans between parish residents and non-residents. Outside borrowers usually accounted for between and ½ of the total loan volume.

Table 7.5

Lending to Parish Residents and Non-Residents: Atlingbo and Balingsta

	1785	1815	1830	1845	1860
Non-Resident Borrowers, Barrels per Inhabitant.					
Balingsta		0.43	0.51	0.52	0.04
Atlingbo	0.03	0.32	0.18	0.24	0.07
Resident-Borrowers, Barrels per Inhabitant.					
Balingsta		1.22	0.92	0.67	0.72
Atlingbo	0.16	0.45	0.34	0.30	0.54
Non-Resident Borrowers in % of Total.					
Balingsta		26	36	44	5
Atlingbo	16	42	34	43	12

Most non-resident borrowers lived in neighbouring parishes. When the demand for loans shrank in the middle of the 19th century, lending to outsiders declined first.

The size of the loans varied substantially among borrowers. The median amount borrowed displays no time trend, but there was a substantial difference between the amounts borrowed by residents and non-residents. The former's loans were approximately twice as large as those of the latter. This applies to both parishes, although the median loan was significantly higher, sometimes twice as large or even more, in Balingsta. It should, however, be remembered that the size of the typical farm in Balingsta was roughly one full *mantal* while those in Atlingbo were only 1/3 as large.

Table 7.6
Median Loan Size in Atlingbo and Balingsta, Barrels

Median Size of Loans	1785	1815	1830	1845	1860
Lending to Non-Resident Borrowers					
Balingsta		2	2.5	2	2.25
Atlingbo	1	1	1	0.75	1
Lending to Resident Borrowers					
Balingsta		4	4.6	4	3.5
Atlingbo	1	2.6	2	1.5	2.6

The practice in Atlingbo during the 18th century seems to have been to report all loans as repaid when the books were closed at the end of the year. If no actual payment had been made, the old loan still was treated as if it had been paid back and then a new loan had been issued. Such a procedure is the only reasonable explanation of why so many debtors so often borrowed exactly the same amount year after year. That exactly same amount of grain was measured out in the fall and measured in the spring makes little sense. Such a procedure would have imposed much work on the managers. The borrowers also would have been losers since the measurements frequently were designed to compensate the *magasin* for its losses (see below).

Beginning in 1804 accounting practices changed and the books began to report what amortization payments actually had been made and how much outstanding debt had been carried over to the following year. Total repayments as a percentage of total loans outstanding varied considerably from year to year. In general, however, they were small, averaging between 10% and 15%. This implies an average loan duration of 7 to 10 years. In 1828, however, there obviously was a drastic change in policy. The average amortization rate increased to approximately 60%, although the year-to-year variations remained unchanged. The explanation seems to be that the county governor in this year started to demand reports on outstanding debts in the *magasins* from the parishes.

No such change occurred in Balingsta. Annual repayments continued to fluctuate more there than in Atlingbo. They varied between 10% and 50%, with an average level of 25%. This latter figure indicates an average loan duration of four years.

The Allocation of Available Surplus

During their early years, certainly many, and probably most, *magasins* reinvested all their interest income in order to accumulate more capital. With an interest rate of 12.5% per annum (4 *kappar* per barrel), the capital stock could be doubled every six years. Although useful when starting out with limited capital, however, such a rate of growth was not sustainable in the long run. Once the *magasins* had reached a volume that became their target level, the surplus available for distribution was between 90 and 100 barrels per year in Balingsta and 12 barrels in Atlingbo.

The available surplus was devoted to four different ends:

- To cover management costs, including losses on defaulted loans.
- To help defray the cost of parish services.
- To pay dividends to the share holders.
- To raise money to contribute to the various parish funds to be used for lending of money and to pay for parish expenditure.

Administration Costs

Some of the *magasins'* administration costs can be directly identified in the financial accounts. These include the fees or salaries paid to the manager(s), the bookkeeper and the grain handlers. Other more temporary or intermittent expenses, such as loan write-offs and building maintenance and construction costs also are identifiable.

The stored grain must have suffered more or less regular losses from (*musfrat),* vermin, dirt, drying and shrinkage (sometimes referred to as *skotramp).*Such losses were much more serious during summer, than winter, storage. A change in humidity could have a significant effect on both weight and volume. According to one source, the difference, presumably in an extreme case, could be as much as 25%.[8] Such storage losses were sometimes the justification for the different procedures used in measuring withdrawals and deliveries. When interest and amortization were paid, the grain was often measured "heaping" (*råge),* which could require an extra 6% to 12.5% (2–4 *kappar).* New loans, however, were often dispersed with a "level" (*struket)* measure.[9] An interesting example of how these measurement practices could affect transactions is one where the Balingsta grain sales to Stockholm had to be supplemented with an additional *kappe* per barrel.

It is difficult to determine how the unavoidable storage losses actually were handled. If there were margins in the system that allowed for normal shrinkage, then there must have been occasions when they were overdone. In some, but not all, cases "over measure" (*overmål)* is noted. Does the absence of such reports imply that the managers received the over measure as a bonus in addition to their salary? That may have been the case, but I have not encountered any evidence of such a practice and the managers may have had little reason to report it. Cases do exist, however, where the managers were held personally responsible for deficits. In addition, when assuming their new position, some managers were required to

post a bond to guarantee the repayment of any losses.

The issue of grain measurement is obviously very complicated. This is seen, for example, in the studies by Lindgren and Morell.[10] Moreover, their narratives are limited to formal institutions and the contents of official decrees. In fact, reality was even more complex. There were a number of informal institutions, which, at best, are only presented in bits and pieces in documents. My sense is that the informal institutions not only varied over time and place, but that they differed with respect to type of crop and the moisture content and cleanliness of the grain.[11] Even the purpose of the transaction might make a difference. Clearly, grain measurement did not belong among the exact sciences.

The Atlingbo managers were remunerated with 1/8 of the *magasin*'s interest income, which meant approximately 1½ barrel. In Balingsta the manager got 8 barrels one half in rye and the other in barley. In Balingsta, the assistant vicar (*komminister)* used to be the regular manager when Åhlenius was the vicar but after him there was a conflict between the parish and the assistant vicar which ended in the school teacher being appointed instead.

The Payment of Dividends to Share Owners and Parish Services.

The original charter of the Atlingbo parish *magasin* stated that once the original 20 barrels of rye had increased to 30, they should for "ever remain an untouched fund for the magazine and in no way be dissolved by withdrawals or sales". As for the interest income from volumes exceeding 30 barrels, however, it was permissible to have them "Sold to satisfy the common or individual needs of the parishioners or to be distributed to them individually in proportion to their contributions". Thus, this latter provision opened the door for dividend payments. Indeed, during the 1790s substantial amounts were distributed to the shareowners. From its establishment in 1768 until 1815 the *magasin* earned a total of 215 barrels of grain in interest payments. Of this amount 100 barrels were paid out as dividends to the owners who once had contributed 20 barrels, and that in a year when the opportunity cost of their grain was low. Thus, an investment with very low opportunity cost and little risk had yielded a five hundred percent return. Even if it took many years for the payments to sum to that amount, such a return must be considered attractive.

As noted above, in Balingsta the regular capital from the parish members was supplemented by voluntary individual deposits. Even non-residents were permitted to participate. Annual returns of 12.5% and 11% were guaranteed to resident and non-resident investors respectively. In 1810 such voluntary deposits amounted to 140 barrels from Balingsta residents and 80 barrels from outsiders. This additional capital amounted to almost 1/4 of the *magasin's* total assets.

This system was sharply criticized by the Dean Eric Bergstrom. In a pamphlet dealing with the *magasins*, he asserted concerning these voluntary deposits that "there is a lack of clear rules almost everywhere, except that it was and is still written in some places that both the capital and the interests thereupon were completely guaranteed. Indeed a secure way for anyone who wanted to make a profit in a legal way and usurp his neighbour and who could do so without fear for destruction of capital and interest and without contributions

to the government".[12] Bergstrom's comment that a risk free, in kind, rate of return exceeding 12% was extremely generous must be seen against the background of the Swedish usury laws of the time. They limited the nominal interest rate on monetary loans to 6% per annum. Furthermore, the considerable inflation of the first decade of the 19th century resulted in a real rate of interest well below 6%. During the 1810s private shares were eliminated in Balingsta. It is uncertain why this happened. One possibility is that the widespread criticism of the system resulted in restrictive measures by the parish. It is also possible, however, that falling grain prices after 1812 resulted in the apparently high, in kind, return being unsatisfactory in monetary or real terms, thus discouraging such investments. The system was formally abolished at a parish assembly meeting in 1816, but by then the volume had already shrunk to a very low level.

The private shares system in Balingsta was not the only example of mixed interests in a *magasin*. In 1804 the governor of Uppsala County criticised two parishes for having transferred the *magasins* to the largest landowner in the parish – a private interest if there ever was one.[13] The survey of 1832 reported that Julita Parish in Södermanland had four different *magasins*, each one linked to one of the four large demesnes in the parish. Nor is this the only such example from Södermanland.

A portion of the profit of the *magasins* was permanently pledged to some social purpose. In Balingsta the school *magasin* that Dean Åhlenius had founded was a major part of the overall parish *magasin*. Its profits were used to pay the school teacher an annual salary that had started at 18.5 barrels but, step by step, had risen to twice that amount by the mid 1830s. Relief payments to the poor varied from year to year because annual decisions were taken on an individual basis. There was, however, a distinct rising trend in relief payments, from 10 barrels in the 1810s to 30 barrels in the 1830s. In addition one barrel per annum was permanently assigned to the parish constable. During the mid 1830s more than half of the *magasin's* annual income was devoted to such purposes.

In Atlingbo there was only one permanent assignment – one barrel per year to the midwife. Her situation was discussed at a parish meeting in 1822. She had received her training in the county seat of Visby at the parish's expense, after which she had "at every birth enjoyed in remuneration what she deserved and what was reasonable". The parish now awarded her an additional fixed annual stipend of one barrel of rye and ½ barrel of barley. She was also promised some "particular reimbursement according to prosperity and good will". The Balingsta midwife was paid in cash from the *magasin* fund, which also had financed her training. Her annual salary amounted to 40 rdr rgs.

Contributions to the Funds.

The Atlingbo church accounts can be followed back to the 1710s. At least since then there had been a church fund acting as a buffer between revenues and expenses. Far from all payments were made in money. The pastor received his tithes in grain and other commodities. Those payments, however, were separate from the church accounts. On occasion, the parish meeting would levy a joint contribution

(*sammanskott)* in the form of sawn boards for the maintenance of the church and vicarage. Thus there was a separate account for lumber in the church books. Besides the church fund there was a poor relief fund, whose profits were dedicated to helping the poor of the parish. One source of revenue for this fund was the property of deceased parishioners. A small percentage of the net value of probate estates was payable to the fund, thus constituting a type of inheritance tax.

In the early 18th century the Atlingbo funds were modest in size. Until the 1730s the church fund consisted of nothing more than a wooden chest with several separate locks. By then, it had been discovered that at least some of the money in the fund could be lent out at interest, thus producing an income for the parish from capital that otherwise would have lain idle. After the church *magasin* had been established and grown to the point that grain sales were possible, money started to flow into the church fund. This new and substantial flow of income exceeded the parish's traditional revenues. As a result the growth of the church fund accelerated sharply. Its earlier function of balancing in- and outflows was now superseded by its role as a generator of interest income. It became the parish's most important revenue source.

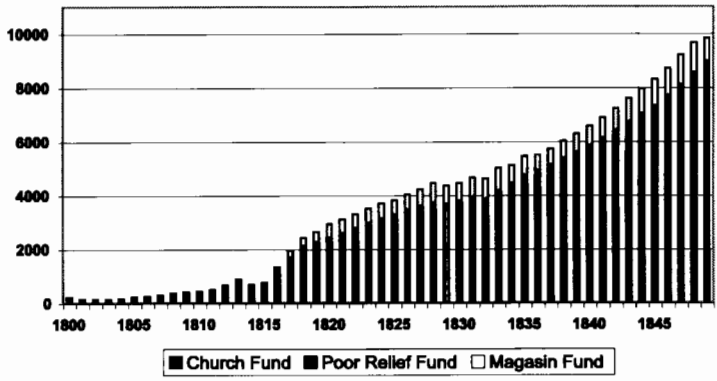


Figure 7.3
Monetary Assets of Church, Poor Relief and *Magasin* Funds in Atlingbo 1800-1849. Rdr rgs.

After the parish *magasin* ceased paying dividends to the shareowners, grain was sold from both the parish and the church *magasins* on a fairly regular basis. Each year the quantities to be sold were determined with the objective of retaining the targeted amount of 100 barrels. Parishioners in need of grain in the spring could choose between buying or borrowing from the *magasin*. Figure 7.4 displays the annual revenues from these sales.

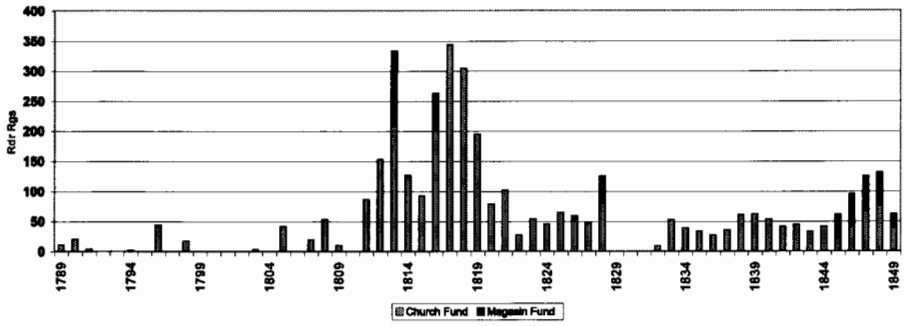


Figure 7.4
Atlingbo: Monetary Receipts to the Church and *Magasin* Funds from Sales and the Repayment of Grain Loans. Rdr rgs.

In 1811 Balingsta also began to sell substantial amounts of grain. These sales were particularly large in 1822, probably because of weak demand for loans during the early 1820s had left the *magasin* with much excess grain. During those years harvests had been very good and prices had fallen. Thus, when it reduced its grain holdings, the *magasin* was simply adjusting to a decreased demand for loans as can be seen in figure 7.2 and the revenue from sales is displayed in figure 7.5.

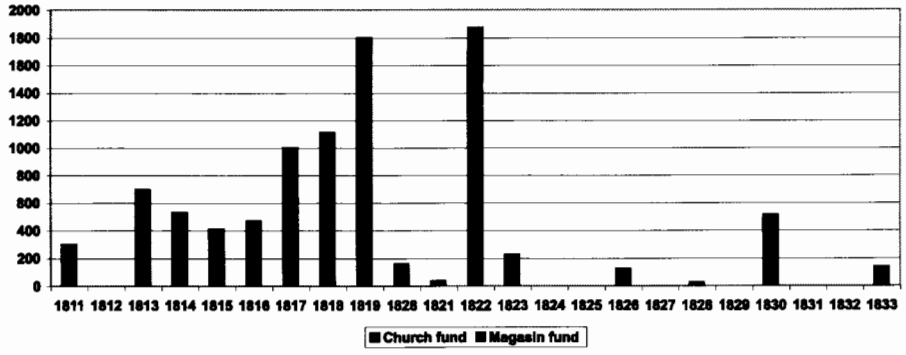


Figure 7.5
Revenue From the Sale of Grain in Balingsta, 1811-33. Rdr rgs.

Developments in the two parishes were quite similar. In both cases, the sale of grain from the *magasins* resulted in money pouring into their funds. The result was a major increase in the lending capacity of the funds, and thus in their ability to earn interest income. The growth of the Balingsta funds is displayed below in figure 7.6. In Balingsta, however, the sales of grain from the *magasin* after the peak in the ten-year period 1813–22 were rather limited, which meant that the additions to the funds were small and they did not have a long-term growth as in Atlingbo.

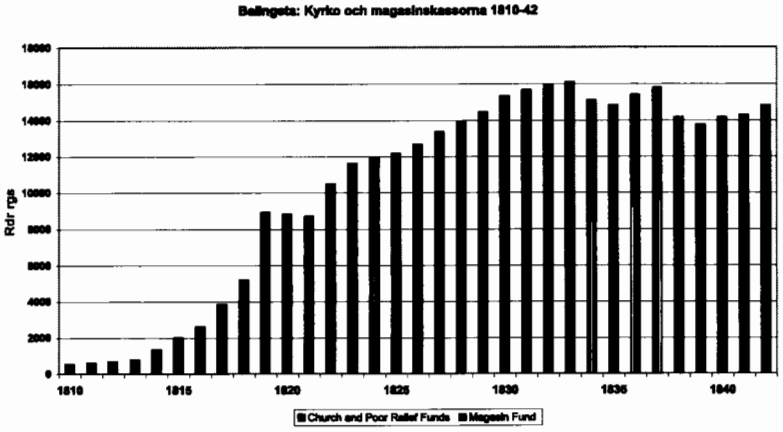


Figure 7.6
The Church and *Magasin* Funds in Balingsta, 1810-42. Rdr rgs.

Both parishes thus experienced the same major shift in the structure of their lending capacity. There was a major increase in the ability to make monetary loans. Although partly a result of decline on the grain side, the principal cause was a growth in monetary assets created by sales of grain from the *magasins*. The funds in both parishes had an extensive lending, which generated an interest income that became the most important source of finance of for the parish expenditure. The increase in the monetary share of total lendable assets is displayed in figure 7.7.

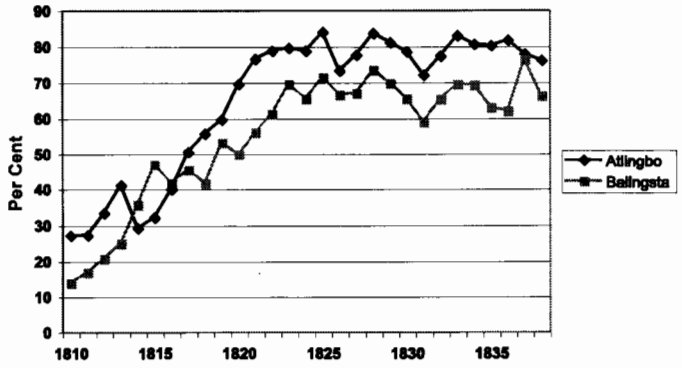


Figure 7.7
Fund Assets As a Percentage of Total *Magasin* and Fund Assets in Atlingbo and Balingsta
Note: The monetary value of the magasins is calculated according to Market Scale Prices

Who Were the Borrowers?

Every year a list of borrowers, together with the amounts they had borrowed, was drawn up. Sometimes these accounts also included their loans remaining from previous years, their interest and amortization payments and their total debt.

This data has been used to examine the borrowers. It was combined with data from the tax rolls (*mantalslängder).* These contain personal information on the peasant, his family and other residents of his farm, as well the size of the farm, measured in *mantal.* Members of lower socio economic groups, such as crofters and soldiers, were also included in the rolls even though they owned no *mantal* units. In those cases when, according to the tax rolls, a single individual cultivated more than one tax unit, the units have been combined and treated as one. To limit the workload, only parish residents have been studied. A similar study of non-resident borrowers would have required a time-consuming search through the tax rolls of several additional parishes.

A large portion of the peasants cultivating *mantal* units had loans from the *magasin* or the fund. This was the case in both parishes and for the entire period studied. Most years, at least 2/3 of these land owning peasants had debts to one or both of the lenders. Clearly, the opportunity to borrow was widely used. More than half of all farms had *magasin* loans except in Atlingbo in 1785.

Table 7.7
Share of Farms with Loans, Per Cent.

	Atlingbo					Balingsta			
	1785	1815	1830	1845	1860	1815	1830	1845	1860
Magasins	41	69	56	50	56	65	61	60	53
Funds	27	62	38	47	44	37	39	69	47
Magasins and/or Funds	45	77	68	56	74	74	68	74	68

In Atlingbo, most of the loans were made to peasants with 0.25 to 0.5 *mantal.* By contrast, in Balingsta more than half of the lent amount went to farms of 0.75, or more, *mantal.* In both cases, the distribution of the loans corresponds quite well with the size distribution of the farms.

Table 7.8
The Distribution of Total *Magasin* and Fund Lending According to Farm Size in Atlingbo and Balingsta, Per Cent.

Atlingbo

Atlingbo										
	Magasin loans					Fund loans				
Mantal	1785	1815	1830	1845	1860	1785	1815	1830	1845	1830
1-1.99		13.1					17.1			7.4
0.75-0.99	16.5					14.3	11.2	0	1.9	
0.5-0.74	39.1	8.8	24.9	19.4	19.2	18.3	1.8	23.5	30.7	43.0
0.25-0.49	44.4	67.8	62.7	66.4	32.0	28.5	62.7	58.0	32.6	24.7
<0.24		9.3	12.5	14.2	48.9	38.9	7.0	18.4	34.8	24.9
	100	100	100	100	100	100	100	100	100	100

Balingsta

Balingsta								
	Magasin loans				Fund loans			
Mantal	1815	1830	1845	1860	1815	1830	1845	1860
>2	10.38	2.7	11.66	20.23		18	10.77	25.92
1-1.99	33.24	41.97	33.95	37.35	18.66	32.03	58.12	37.3
0.75-0.99	11.96	11.05	15.01	15.05	33.47	16.58	11.32	8.5
0.5-0.74	26.35	28.96	29.14	20.57	29.68	20.56	9.7	25.07
0.25-0.49	13.87	15.32	10.24	6.8	13.53	12.83	10.14	3.2
<0.24	4.2	0	0		4.7			
	100	100	100	100	100	100	100	100

The distribution of monetary loans from the funds does not differ markedly from that of the *magasin* loans. Some tendency for the monetary loans to go to peasants with larger land holdings, however, can be detected.

The Share of Parish Debts in Total Indebtedness

The previous analysis demonstrated that cultivators - who might be peasants or upper class persons – owners or tenants of farms of all sizes were borrowers from the *magasins* and funds. Indeed, a majority of the cultivators of *mantal* units in Atlingbo and Balingsta took advantage of these loans. (table 7.17) That conclusion, however, says nothing about the importance of the loans to those who received them. How much total debt did the parish residents carry and what share of those debts were owed to parish institutions?

All registered probate records from the two parishes for the period 1811–63 have been examined for this study.[14] In total there are 54 estates containing assets, and therefore of interest here, from Atlingbo and 170 from Balingsta. This list of estates has not been crosschecked against the mortality records of the parishes, however, so the extent and accuracy of their coverage can not be determined. Given this situation, as well as the length of period, I have not attempted to emulate Lindgren (2002) and Perlinge (2005) in constructing an overview of the entire population's indebtedness. Nevertheless, I believe that valuable information can be extracted from the probate records. The material has been divided into two time periods in order to get some sense of the changes that must have occurred over such a long period. The dividing line has been drawn in 1836 in order to place roughly the same number of observations on each side.

Table 7.9
Number of Probate Inventories Examined: Atlingbo and Balingsta

	1811-36	1837-63
Balingsta	80	90
Atlingbo	27	27

For each estate the total value of all assets and all debts has been recorded. Note has also been taken of the extent to which the assets included cash, precious metals and personal debts. Among the liabilities the sums owed to *magasins* and funds, both in the decendent's home parish and elsewhere, have been separated out, as have loans from institutions such as discount (*diskonter),* savings and mortgage banks. Debts to retailers, relatives and the tax authorities also have been considered. In the case of tenant farmers there were sometimes debts to the demesne. The largest liability category, however, consistently was debts to individuals. This finding confirms the result of other studies that informal personal credits were the mainstay of the contemporary credit market.

The probate records have been used to study the distribution of borrowing from the *magasins* and the funds among the parish residents. The observations have been grouped into deciles on the basis of total gross estate assets. Although the methodology used is very different from that of earlier studies here, the results are reasonably close. Assets were unequally distributed. In Balingsta the top 10% of the wealth distribution owned 67% and 70% respectively of total assets in the two periods, while the lowest 50% only had between 3½% and 4%. The complete distribution was probably even more skewed since it is reasonable to assume that probate records are especially likely to be missing for estates with few or no assets. Not surprisingly, those with the largest gross assets also had the largest debts.

The study confirms the previous observation that wealthy parishioners made no less use of the *magasins* and funds than did those with median assets, and certainly more than those with few assets. When the well off borrowed, they took larger loans. It is interesting to observe how loans grew in importance over time. This was particularly true for the funds loans in the second period, almost 80% of whose fund loans reported in the inventories had been taken by the top 10% of asset owners.

Table 7.10

Assets and Debts in Probate Inventories in Balingsta.
Percentage Distribution of Total Debts Among Decil Groups Ranked by Value of Gross Assets.

	Total assets		Total debts		Magasin debts		Fund debts		Total debts to Magasins and Funds	
Decil	1811-36	1837-63	1811-36	1837-63	1811-36	1837-63	1811-36	1837-63	1811-36	1837-63
1	66.6	70.7	25.0	59.7	5.1	15.8	7.9	78.8	6.4	65.3
2	14.4	14.4	25.7	24.6	24.7	35.0	48.2	11.9	35.2	16.9
3	7.1	6.4	22.2	6.1	28.4	29.4	26.3	3.6	27.5	9.1
4	4.9	3.0	7.8	2.7	18.0	7.8	5.1	1.8	12.2	3.1
5	3.1	1.9	8.9	2.0	10.7	8.5	0.6	2.3	6.2	3.6
6	1.7	1.3	4.9	1.0	10.8	2.4	6.6	1.0	8.9	1.3
7	1.0	1.0	2.9	2.8	1.8	1.1	3.6	0.6	2.6	0.7
8	0.7	0.6	1.1	0.7	0.4	0.0	0.0	0.0	0.2	0.0
9	0.4	0.4	1.0	0.2	0.0	0.0	1.6	0.0	0.7	0.0
10	0.2	0.2	0.6	0.2	0.1	0.0	0.0	0.0	0.0	0.0

The relative importance of loans from *magasins* and funds in total indebtedness has also been studied.

The principal conclusion to be drawn from this data is that loans from *magasins* and the various parish funds constituted only a limited part of total borrowing by all decil groups. In no decil group did the *magasin* and fund loans together exceed 1/3 of the total indebtedness. Comparing the two periods, the importance of *magasin* loans decreased and that of fund loans increased over time.

Table 7.11

Balingsta: Percentage Share of Magasins and Fund Debts in Total Indebtedness in Various Decil Groups Ranked According to Value of Gross Assets.

	Debts as % of assets		Debts to magasins as % of total debts		Debts to funds % of total debts		Magasin + fund debts in % of total debts	
Decil	1811-36	1837-63	1811-36	1837-63	1811-36	1837-63	1811-36	1837-63
1	7.4	35.4	1.9	1.0	2.4	19.0	4.4	20.1
2	34.9	71.4	9.1	5.6	14.4	7.0	23.5	12.6
3	61.3	39.6	12.1	19.1	9.1	8.5	21.1	27.5
4	31.5	37.8	21.8	11.3	5.0	9.5	26.8	20.8
5	56.8	44.9	11.4	16.5	0.5	16.4	11.9	32.9
6	58.7	30.9	20.7	9.4	10.2	14.5	31.0	23.9
7	58.5	121.8	5.8	1.6	9.7	3.3	15.5	4.9
8	31.3	52.8	3.6	0.0	0.0	0.0	3.6	0.0
9	46.3	22.1	0.0	0.0	12.1	0.0	12.1	0.0
10	61.3	44.0	1.3	0.0	0.0	0.0	1.3	0.0
All	19.7	41.9	9.5	3.9	7.6	14.4	17.1	18.4

For Atlingbo the small number of observations forced a consolidation of the decil asset distribution into quintiles. That is to say five groups instead of ten. Here the distribution of assets in the probate records is extremely skewed as well, although somewhat less than in Balingsta. The debts to the *magasins* are concentrated in the middle of the asset distribution. Although not to the degree observed in Balingsta, debts to the funds once again are concentrated among the large asset owners.

Table 7.12

Atlingbo: Assets and Debts in Probate Inventories. Percentage Distribution of Total Debts Among Quintile Groups Ranked by Value of Gross Assets.

Quintile	Total assets		Magasin debts		Fund debts		Magasin + Fund debts	
	1811-36	1837-63	1811-36	1837-63	1811-36	1837-63	1811-36	1837-63
1	56.6	52.7	29.8	6.8	81.3	35.2	60.5	22.3
2	28.0	23.9	4.9	63.1	11.0	22.5	8.5	49.8
3	11.2	13.1	43.7	8.5	6.7	18.8	21.6	12.2
4	3.8	7.4	15.8	4.6	0.3	11.5	6.5	7.4
5	0.4	3.0	5.9	17.0	0.8	12.0	2.8	8.3
	100	100	100	100	100	100	100	100

Relative to assets, debts did not increase in Atlingbo as they did in Balingsta. Another clear difference is that *magasin* debts were a larger share of total indebtness in Atlingbo than in Balingsta. Since the same holds true for fund debts, parish sources

of credit were obviously relatively more important in Atlingbo. This may have been the result of a lack of alternative sources of credit on the island of Gotland.

Table 7.13
Percentage Share of *Magasin* and Fund Debts in Total Indebtedness in Various Quintile Groups Ranked According to Value of Gross Assets in Atlingbo

	Debts as % of assets		Debts to magasins as % of total debts		Fund debts as % of total debts		Magasin and Fund debts in % of total debts	
	1811-36	1837-63	1811-36	1837-63	1811-36	1837-63	1811-36	1837-63
1	25.3	11.0	6.3	0.6	25.4	40.7	31.6	41.3
2	24.0	49.5	2.2	2.7	7.3	12.8	9.5	15.5
3	43.5	40.1	26.9	0.8	6.1	24.1	33.0	24.9
4	14.8	38.6	85.1	0.8	2.4	27.0	87.6	27.9
5	124.4	78.8	33.0	3.6	6.3	33.8	39.3	37.4
All	27.0	28.1	11.1	1.8	16.5	23.9	27.7	25.7

The data demonstrate that peasants and other cultivators frequently were indebted to parish institutions, but that these debts were usually only a limited part of their total indebtedness.

The *Magasins* and Famine Prevention

The original motivation for the parish *magasin* was that they would serve as an emergency grain reserve in case of crop failure. To what extent was this objective achieved? Obviously increased amounts of grain could only be lent if there was grain available when harvests failed. In the spring the *magasins* had whatever grain they had retained over the summer plus the interest and amortization payments that had been made during the fall. Figures 7.8 and 7.9 make it clear that very little or no grain was normally retained and stored over the summer. Only good harvests, naturally accompanied by weak demand for loans, would result in substantial summer storage in the following year. It was grain that could not be lent, not a planned emergency reserve. Since storage resulted both in shrinkage and foregone interest earnings, it was not something sought by the managers.

Annual lending capacity did increase in Atlingbo after 1827 following a tightening of loan collection practices. Average annual amortization, which previously had hovered around 12% of outstanding loans, rose to more than 60%. The typical life of a loan thus decreased from 8 to 1–2 years. Still, the rate of amortization continued to vary substantially between years. Correlating the amortization rate with harvest outcomes in Gotland yields a coefficient of 0.69 for the period of 1804–26. As expected, amortization rates were high following a good, and low following a poor, harvest. In the post-1826 period, when amortization rates were generally higher, the same pattern was present although with a lower correlation.

Low amortization rates following poor harvests reduced the *magasins'* new lending capacity below what it was following good harvests. That, of course, is the opposite of the original intention. Nevertheless, the *magasins* were able to provide

some limited relief at the parish level. In Atlingbo two typical crisis years, 1783 and 1845, have been studied. Following a poor harvest, the entire lending capacity available in the spring of 1784 was utilized. Reducing the loans to non-residents permitted a strong increase in new loans to residents. In effect, virtually all new loans were made to residents. In the spring of 1845, 43% of total borrowing was by non-residents, still leaving a substantial amount of grain for summer storage. The bad harvest experienced that fall, however, resulted in a strong demand for loans in the spring of 1846. Of the unusually large amounts of grain then available in store almost all went to resident borrowers. Those who lived in the parish also received loans that on average were substantially larger than those granted to outsiders, on average, one full barrel versus 1/4 barrel. Although there was little over all counter cyclical impact, the priority given to parish residents provided at least them with some relief in times of scarcity.

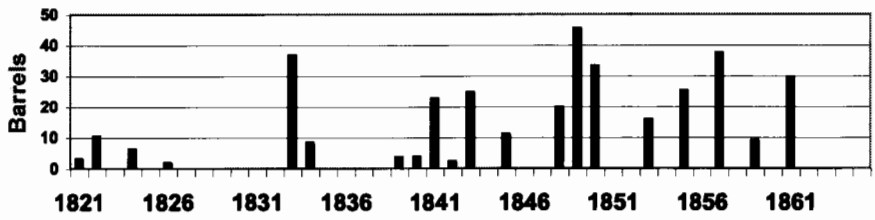


Figure 7.8
Grain Retained by the Atlingbo *Magasins*, 1820-1865. Barrels.

The parish's greater interest in profits than in relief capacity is fully revealed in the minutes of the 1833 parish meeting, where a general circular from the county governor was discussed. He suggested that half the assets of every *magasin* be kept in reserve and not lent until after June 15, and then only after an assessment of the famine risk and with the governor's permission. The parish meeting adamantly opposed this proposal on the grounds that it might reduce the demand for the services, and therefore the interest income, of their *magasin*.

It was more common for grain to be stored over the summer in Balingsta than in Atlingbo. Thus, the ability to help alleviate the consequences of a poor harvest also should have been greater in Balingsta. Evidence that such was the case, however, is hard to find. Once again, the explanation lies in the low rate of amortization that followed crop failures. According to the harvest evaluation series, there were two especially bad years in Uppsala County during the period covered, 1818 and 1845. In the spring following those disasters all available grain was lent. That, however, only permitted new loans of 45 barrels in 1819 and 12 barrels in 1846. These amounts can be compared with average new loans of 186 barrels per year. During the bad years, not only were amortization payments omitted, even interest payments were postponed. A similar strong correlation between harvest outcomes and amortization was also present in Balingsta. For the period 1806–59 the correlation coefficient was 0.61.

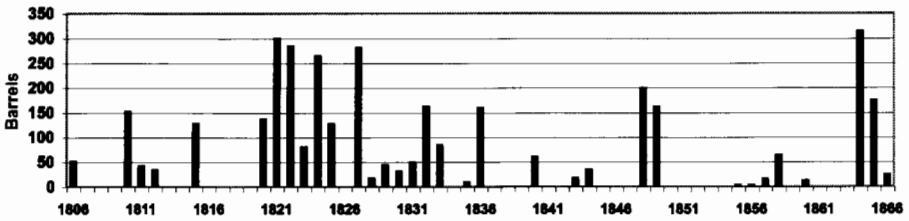


Figure 7.9
Grain Retained by the Balingsta *Magasins*, 1806-66. Barrels

Säby and Buttle

At least in terms of *magasin* assets per inhabitant, Atlingbo and Balingsta were atypical. It is therefore important to determine whether or not their particular traits also were present in other parishes. Two such parishes with smaller *magasin* assets, Butte on Gotland and Säby in Västmanland, have been chosen for comparison. Their principal characteristics are displayed in table 7.14.

Table 7.14
Principal Characteristics of Buttle and Säby

	Buttle	County Median Gotland	Säby	County Median Västmanland
Population 1830	227	330	501	1043
Mantal per Parish	6.0	11.7	25	37
Nobility land	0	0	23	15
Free holding land, per cent share	92	96	70	70
Magasin Assets, Barells per Inhabitant	0.31	0.19	0.27	0.19

Source: Hammar (1860) and KSLA

Both are among the smaller parishes in their respective counties. Buttle had approximately the same population as Atlingbo, but significantly fewer *mantals*. Although this measure was far from exact, it does reflect the poorer agricultural conditions in Buttle. It was located roughly 15 kilometers east of Atlingbo, in a largely forested area. It stands out as being one of the first parishes to establish a *magasin*, having done so in 1741.

Säby is located west of Västerås, close to, but not actually on, the shores of Lake Mälar. The parish was located immediatly south of the iron works district, the *Bergslag*. The parish's assistant vicar Olof Grau, who in 1754 published a book describing all the parishes in Västmanland, observed that the soil in Säby was very fertile clay. In addition, most of the villages had high quality pastures and access to timber. Finally, a small lake and the Kolbäck River were a rewarding source of fresh fish.[15]

The farm size structure of the two parishes differed substantially. More than half the total *mantals* in Säby were cultivated by four units, each of which contained at least one *mantal*. By contrast, 80% of the total *mantal* in Buttle were cultivated in units of less than half a *mantal* each. Thus, in Buttle the farms were both

unusually small and similar in size. All the land in Buttle was freehold, as was most of Säby. In the latter parish, however, there also was a large Crown estate dedicated to the army and two noble demesnes.

Table 7.15
Farm Size Distribution in Säby and Buttle

	No of farms		Distribution of mantal %	
	Säby	Buttle	Säby	Buttle
>2	1		12.2	
1-2	3		41.8	
0.75-1	4		12.7	
0.5-0.75	4	2	8.2	17.4
0.25-0.5	15	12	19.1	61.7
0.01-0.25	12	10	6.0	20.9
Sum	39	24		

Source: Länsräkenskaperna, RA.

The History of the Magasins in Säby and Buttle

According to the 1832 inventory, Säby, like almost all Västmanland parishes, established its *magasin* in 1750. A charter from that time is available and, starting then. it is possible to trace the activities of the *magasin* through its preserved accounts. Digging further into the Säby church archives, however, reveals a possible precursor. In the minutes of the parish meeting held on November 23, 1735, reference is made to a decision to establish a *magasin* in accordance with the previous year's Royal Decree[16]. It was noted that the interest income was to be devoted to helping the poor. Following up this decision, in November 1737 a further entry reminds those parishioners who had not yet contributed to the initial capital to do so forthwith. The final result of this decision, as well as of the ensuing admonition, however, is unclear. No further reference to this question appears until 1748. In that year, the local pastor suggested that a *magasin* similar to that in the neighboring parish of Dingtuna be established. The fact that this suggestion was made, and went nowhere, is an indication that any earlier *magasin* either had never materialized or else had long since vanished.

In 1749 the pastor of Säby received a letter from a certain Colonel Jean Elving, then residing in Helsinki. As thanks for the kind treatment he had once received as a young orphan living in the parish, the Colonel promised to provide an annual gift to benefit Säby's poor. His money was used to buy the grain that formed the basis of a poor relief *magasin* that was established in addition to the regular Säby parish *magasin*. For twenty years the two institutions grew in parallel. In the case of the parish *magasin* asset growth was temporarily halted during the second half of the 1750s when the parishioners' original contributions of 1750 were returned. The charter had provided for such a possibility once accrued interest had increased the magasin's assets to twice their original size. Most of

the parishioners took advantage of this opportunity. Those who let their original contribution remain with the *magasin* were rewarded with the right to borrow at two *kappar* of interest (6.25%), half the regular rate. During the 1770s both *magasins* stopped growing. For several years the parish *magasin* had substantial amounts of unborrowed grain, while the poor relief *magasin* disposed of much grain either through sales or direct donations to the poor. During the 1780s and 1790s the poor relief *magasin* instead retained the excess grain, sometimes amounting to more than the total amount lent.

A new period of expansion began in the late 1790s and peaked in 1809. Following unusually large repayments after the harvests of 1809 and 1810, there were no outstanding debts. All the grain due had been returned to the storehouse. The following spring, in April of 1811, a parish "crisis" meeting was held. The demand for loans had declined to the extent that in spite of large sales very large summer carryovers of grain loomed. By that time, only ¼ of the grain available for lending had found borrowers. Since the raw lumber of the newly constructed barn needed further drying and the stored grain was sometimes insufficiently dried, a great deal of spoilage could be expected over the forthcoming summer. At the meeting it was also pointed out that the interest rate charged was so high that only persons in acute need would borrow from the *magasin*, and then only as a last resort. If interest rates were reduced, however, it was believed that more widespread borrowing would result. Although it was not mentioned, it is likely that competition from *magasins* in neighboring parishes also played a role.[17] It was even argued at the meeting that, in order to prevent large-scale spoilage and to maintain interest income, the parishioners should be required to borrow grain from the *magasin*. The meeting finally agreed on a strategy. The interest rate was to be cut in half and grain loans were to be made available on three occasions during the spring. If any grain still remained, however, the parishioners would be required to borrow it in proportion to their *mantal* holdings.

The lower interest rate caused resurgence in borrowing until 1819. During the first half of the 1820s, however, a new sharp decrease in the demand for loans occurred. Finally, after a recovery in the early 1830s, the volume of grain lent remained reasonably stable. As for the poor relief *magasin*, its loans had remained stagnant starting in the 1780s. Clearly the growth of the Säby *magasins* was hindered by a lack of demand.

The Buttle *magasin* was among the oldest in Sweden. It appears to have been established at the behest of the county governor of Gotland, who in 1740 reported his activities in this regard to the Board for Public Lands and Funds (see chapter 6). The parish was too small to afford its own pastor and thus, together with the equally small parish of Gullrupe, and the somewhat larger parish Vänge formed the Vänge *pastorat*. There is nothing to indicate that the pastor played any significant role in establishing the parish *magasin*. The accounts instead indicate that a *länsman*, (constable), Bromander, who owned a farm in the parish, was the driving force and initial manager. In 1766 a group of peasants donated grain to a parallel poor relief *magasin*. Things were further complicated in 1769 when, at the urging of the bishop, the parish *magasin* was split into two parts, one for the parish and one

for the church.[18] In 1830, however, in line with the county governor's 1814 master charter for parish *magasins* on Gotland, the three Buttle *magasins* were merged into a single institution, but separate accounts in the balance sheet.

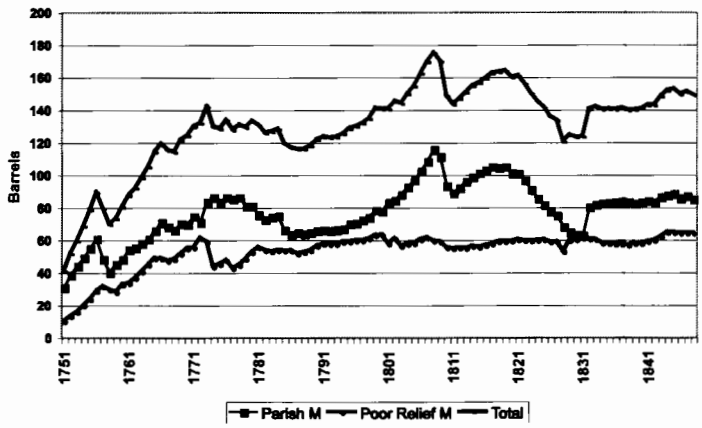


Figure 7.10
Asset Growth of the Säby *Magasins* 1751-1845. Barrels.

The parish *magasin* in Buttle experienced rapid growth until the early 1760s. In response to a large unborrowed surplus in 1761, however, the parish sold grain during following two years. The drop in assets later recorded in 1785 was no doubt at least partly the result of sales. Still, a comment in the ledger books to the effect that the accounts and administration had been put in better order in connection with the election of new managers hints at a further explanation. The poor relief *magasin* experienced a reduction in its loans in 1793 when two large, long-standing, loans to non-parish clergymen vanished from the accounts without any evidence of repayment. Whether they actually were paid off, either in money or grain, or simply written-off, is unclear. Frequent grain sales during most of the 1790s probably reflected a limited demand for loans. Starting in 1790 and continuing for the following ten years, however, loan demand once again increased substantially. Then, starting in 1818, low prices were accompanied by falling loan volumes. As this chronology makes clear, Buttle was following the general national pattern.

Unfortunately, I have been unable to locate neither the church magasin accounts since 1769 nor the post-1830 merged *magasin* accounts. Reports from the parish on the total assets of all three magasins from the years 1826–28 and after 1830 are available in the archives of the county office, the *landskontor*. From them one can infer that the church magasin had grown to a size that overshadowed the other two since the total assets in these years were reported to have been more than 100 barrels. This level must then have been reduced since for the years after 1830 the records in the *landskontor* indicate that the Buttle *magasins* were maintained at a stable level of 75 barrels, reflecting an active striving to achieve a pre-determined fixed target by annual sales of interest income in excess of expenditure.

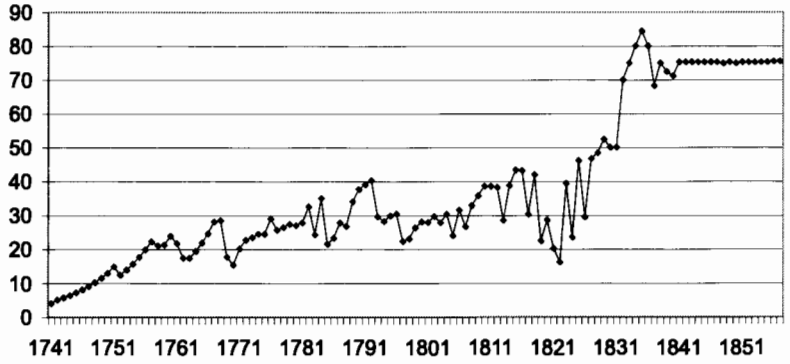


Figure 7.11

The Buttle Parish and Poor Relief *Magasins*, 1741-1855. Barrels.

Note: The assets of the church magasin are not included before 1831.

The Distribution of Profits

For a number of years during the 1770s, when the Säby parish *magasin* experienced a decline in loan demand, grain was distributed directly to the poor. Later, starting in the 1783, the *magasin* took responsibility for paying the midwife's base salary of two barrels per year. When once again loan demand was low during the 1820s, the distribution of grain to the poor resumed. Thus it seems as if poor relief in the form of grain allotments was used by the *magasins* to adjust lending capacity to demand. The poor relief *magasin* was a more stable source of grain for the indigent. The eventual reduction in the interest rate charged naturally reduced profits and thus the sums available for communal purposes. The effect was reinforced by high costs of administration. Remuneration for the manager, the measurer and the bookkeeper varied between 30% and more than 40% of the annual interest income. As in Balingsta, it often served as a supplement to the assistant vicar's salary.

The accounts of the Buttle *magasin* are not easy reading. For the most part, they are limited to a listing of loans outstanding, sometimes without even being summed. Notes about grain being retained in the *magasin* over the summer are only included for occasional years, even though it is seems clear that such surpluses also existed for some other years. Information concerning the sale of grain is seldom included, even for years when a sharp reduction in the amounts lent makes it likely that sales occurred. The books of the poor relief *magasin* often contain information on grain donated to the needy, but there were probably other allocations that are not reported. Such omissions make it difficult to analyze the distribution of the surpluses accumulated by the Buttle *magasins*. It is clear, however, that they were important to the community. The introduction to the account book of the poor relief magasin notes that the initial parish *magasin* capital

of 3 1/4 barrels had grown to 24 barrels. Moreover, profits had been used to improve the stone vicarage and had allowed 26 years of work on the previously dilapidated church, thus saving it from likely ruin. These projects, it was reported, had brought great joy to the parishioners. In retrospect, it is clear that adequately financing parish activities on basis of a mere 6.5 *mantal* must have been a real challenge.

Who Were the Borrowers?

In both Atlingbo and Balingsta the high level of activity was partly the result of substantial lending to residents of neighboring parishes. In Säby virtually no loans were made to non-parishioners and in Buttle they were both quite variable and less extensive than in Atlingbo.

Table 7.16
Lending to Non-Parishioners by the Buttle Parish and Poor Relief *Magasins* (Percent)

	1785	1800	1815	1830
Per Cent	19	8	40	12

Another feature common to Atlingbo and Balingsta was that, except for the very largest holdings, a large proportion of all farms borrowed from the *magasins*. An examination of the aggregate loans of the two Säby *magasins* and of the two *magasins* in Buttle whose loan accounts are available tends to confirm the conclusion that *magasin* loans were very common among various types of farm families. Since data from the Buttle church *magasin* are lacking the values for Buttle in tables 7.17 and 7.18 are most certainly underestimated. The data from all four parishes also indicates that, although very frequent, these loans were generally modest in size. The striking exception in this regard is Balingsta where the median loan size was consistently much larger than those in the other three parishes.

Table 7. 17
Share of Farms in Various Size Groups with Loans in the *Magasins*, Per Cent.

Size, mantal	1815				1845			
	Atlingbo	Balingsta	Buttle	Säby	Atlingbo	Balingsta	Buttle (1830)	Säby
2-	-	33	-		-	66	-	0
1-2	50	82	-	25		50	-	0
0.75-1	0	55		83	0	50	-	75
0.5-0.75	40	73	0	75	50	86	50	60
0.25-0.5	100	100	33	72	60	40	75	60
0.01-0.5	60	50	55	83	40	-	45	31

Table 7.18
Median Loan Size (Barrels) by Farm Size and by Parish.

Size, mantal	1815				1845			
	Atlingbo	Balingsta	Buttle	Säby	Atlingbo	Balingsta	Buttle (1830)	Säby
2-		22.9				14.5		
1-2	10.3	8.7		1.9		9		0
0.75-1	0	9		3.5	0	16.3		4.5
0.5-0.75	3.3	3.7	0	1.8	2.9	10.5	1	5.8
0.25-0.5	2.2	18.4	1	3.2	1.8	11.5	1.75	3
0.01-0.5	2.6	19.2	1.5	1.7	1.5	-	1.5	2.6

The probate inventories from Buttle and Säby have not been examined. In light of the findings just reported, however, it seem highly likely that such an examination would confirm the conclusion that *magasin* loans amounted to only a modest share of most individuals' total debt.

Amortization Payments

In Säby the amortization payments (calculated as a percentage of the same year's lending) display great variability, both annually and cyclically. These variations were quite similar for both of the parish's *magasins,* implying that, instead of being random, they were influenced by some common factor(s). What these might have been, however, is difficult to exactly determine but it seems likely that conditions in the grain market affected repayment rates. A closer examination of the 87 years between 1753 and 1839 reveals that in 15 out of the 20 years with the greatest year-to-year price increase there was a decrease in amortization compared with previous year. Moreover, in 15 out of the 20 years with the greatest annual price decrease there was an increase in amortization. Of course, that price movements had a major impact on repayment rates should not come as a surprise.

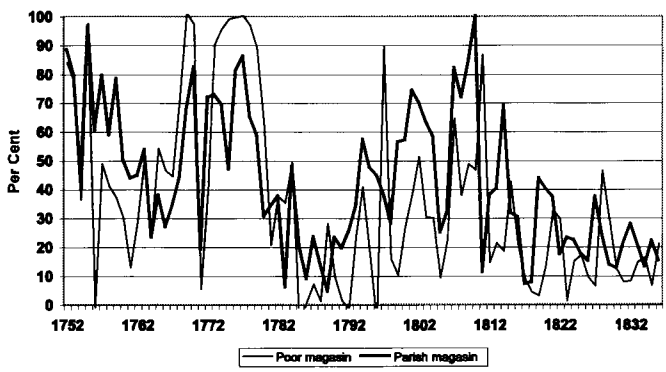


Figure 7.12
Amortization as a percentage of lending in the two Säby *magasins,* 1753-1839.

For the period 1805–30 the bookkeeping in Buttle allows amortization payments to be identified. There, as in Säby, the amortization rates as a percentage of outstanding loans for the two Buttle *magasins* display a similar pattern over time. Although they fluctuate substantially, the correlation coefficient of the two series is 0.66. These variations in Buttle are also rather similar to those in the not so distant parish of Atlingbo (correlation coefficient of 0.53), although the fluctuations were sharper in Buttle than in Atlingbo (see figure 7.13). All of this evidence confirms the presence of market-related forces affecting the incentives for borrowers to either extend or pay off their loans.

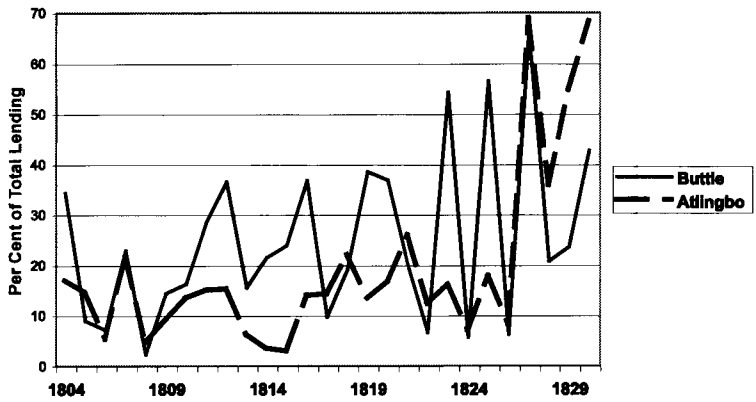


Figure 7.13
Amortization as a Percentage of Lending in Atlingbo and Buttle, 1804-30

Conclusion

The three parishes for which data is available back to the 18th century all initially displayed strong growth, followed by an interval of stagnation. Common to all four parishes studied here was rapid expansion during the first decade of the 19th century, when both nominal and real grain prices rose dramatically. Their activities then declined in unison during the early 1820s while grain prices fell sharply.

Potential profits seem to have served as a strong incentive. In two of the parishes direct repayments to the parishioners are documented. In all cases surplus grain was either directly utilized for, or else sold to finance, communal activities.

Yet another trait common to all the parishes was that a large proportion of the farmers (even those with rather large holdings) availed themselves of *magasin* loans. Since they were generally limited in size, however, there is every reason to believe that these loans usually constituted only a modest part of a peasant's total debt. Most borrowers rolled their debts over for several years, their annual repayment behaviour being influenced by the size of the harvest and conditions on the local grain market.

Footnotes

[1] See chapter 5.
[2] Åmark (1915) p.329.
[3] Öhrman (1990), Lindberg (2004).
[4] A *pastorat* could consist of a single parish, but quite often it contained several parishes linked together and having a common pastor. The usual motivation was that some of the participating parishes were too small to afford a pastor of their own.
[5] The term *konsistoriell* refers to the fact that the formal decision was taken by the consistory, the governing body of the diocese.
[6] *Mantal* no doubt functioned better as a relative measure within a parish than for making comparisons between two parishes, distant from each other and located in different counties.
[7] Bergström (1827) p.21.
[8] Meyers Grosses Konversations Lexicon Bd 7 (1905).
[9] In the Italian *Monti Frumentari* such alternative measuring practices were used to charge interest. See chapter 1.
[10] Lindgren (1971) and Morell (1988).
[11] Russian rye was considered superior to Swedish rye. Thus the former was sold without the "heaping" that was required of the Swedish product. Åmark (1915) p. 130.
[12] Bergström (1818) p.5.
[13] Letter from CG in Uppsala to KM 27 April 1804. RA.
[14] Hagunda häradsrätt, Boupptecknings, Ula; Södra häradet, Boupptecknings Vila.
[15] Grau (1754) p.247.
[16] See chapter 6.
[17] In the much larger neighboring parish of Munktorp, the original interest rate of 4 *kappar* had been cut in half in 1796. Munktorp CA. Ula.
[18] Vänge CA. Vila.

CHAPTER VIII

The Rise and Fall of an Institution

Hypotheses for an Interpretation

In the previous chapters it was argued that grain–harvest volatility caused difficulties for the individual peasant. Lifting the focus from the household to a more aggregated level, it also was demonstrated that volatility of the supply can be reduced by market integration over a larger area. (See chapter 3). This is especially the case if foreign trade is possible. In particular, foreign supplies can greatly reduce the risk of very high prices. (See chapter 4). In the 18th century Stockholm was linked to the world market by almost continuous imports. (See chapter 5). As a result prices were to a large extent determined by the world market and there was less price volatility than in many other European cities. The analysis also indicated that storage provided little additional protection against very high prices when import was available. What storage perhaps could do was to some extent reduce the producers' risk for very low prices and difficulties to find an out let for the surplus grain.

Parish *magasins* made their initial appearance as early as the 1650s. During the ensuing century, however, there was little activity, although probably more than now available evidence indicates. After several decades of largely futile discussion, in 1750 a wave of establishments suddenly swept over some, although not all, parts of the country. The high rate at which new *magasins* were being created persisted for approximately two decades. Later, during the early decades of the 19th century a new burst of establishments occurred in more peripheral areas. After 1820 few parishes established new *magasins*. Once founded, the *magasins* usually experienced rapid initial growth. Above some level, however, they tended to stagnate. Most *magasins* seem to have reached their maximum size sometime between 1810 and 1830. During the last third of the 19th century those still surviving gradually died off. Both the size of the *magasins*, measured in assets per parish inhabitant, and the rate of interest they charged on their loans varied, although some regional patterns are discernable. (See chapter 6.) The *magasins* seem to have been widely utilized both by peasants, regardless of the amount of land they cultivated, and by upper class persons (*ståndspersoner*). The share of *magasin* debts in total indebtedness, however, was usually rather small. There is no evidence to indicate that the *magasins* played a major role in famine relief following crop failures. (See chapter 7).

This description of the *magasins* differs somewhat from their contemporary image, especially in the 18th century. The *magasins* were presented as a means

to alleviate food shortages resulting from harvest failures, and sometimes as an institution capable of stabilizing the entire grain market. Since the *magasins* utterly failed to live up to these expectations, how did they come into existence and why did they prosper?

The development of the *magasins* obviously cannot be explained in terms of the hopes placed upon them in the preceding political debate. Based on the descriptions presented in the previous chapters, the following hypotheses have instead been posed to serve as a point of departure for an interpretation of the institution.

- Hierarchical action was required for the establishment of the *magasins*.
- Locally their establishment and further development required the active participation of actors motivated by self-interest or community concern.
- Demand for loans in grain by credit-worthy individuals was essential.

These conditions were generally necessary, but far from sufficient, for the establishment and development of a parish *magasin*. The following discussion will introduce additional important considerations.

The previous chapters have demonstrated that economic theory can be a useful tool in explaining the past. Economic questions, such as how prices were formed, can be answered. In practice, however, economists and historians have often addressed different problems, and with different methods. Institutions have always been of central interest to historians. Starting with Ronald Coase several decades ago, economists have worked to include institutions in their theoretical paradigm by applying the concept of transaction costs. Their interest has focused on how institutions influenced transactions, rather then on how and why they evolved. The historical aspects of institutions should not be ignored, since the institutions are space and time dependent. History and geography matter for institutional change. The parish *magasins* provide one case study of how institutions are established, develop and, eventually, disappear.

Hayami and Ruttan (1985) have suggested that in studying the development of institutions a distinction can be drawn between demand and supply. Supply arises from political initiatives to establish new rules and forms of organization. Demand in their analysis refers to the perceived need for means to deal with demographic and technical factors in new ways. Bardhan (1989) has commented that such a distinction is not always easy to draw, and there are cases when factors, which could be labelled supply and demand, are mutually interdependent. With regard to the *magasins*, however, I believe any such problem is minor, and the suggested distinction may be helpful. Here the concepts have been used so that supply corresponds to the hierarchical initiatives taken to encourage the establishment of a *magasin*. The local demand for the *magasin* institution derived from two motives. First, the attraction of potential profits and second, the desire of the peasantry to have a source of in kind loans.

Institutions had a great impact not only on the government's ability to supply its crucial needs for grain, but also on the functioning of markets. In the following section, hierarchical institutions of society, as well as the incentives of the parishioners and the demand for loans, will be studied.

The Environmental and Institutional Setting of Grain Supply

The Environment

In the past, and still today, the conditions for agriculture vary among various parts of the country. In 1919 Statistics Sweden introduced the concept of natural agricultural areas in order to improve their statistical analysis. These areas were based on natural factors affecting agriculture and did not coincide with existing administrative boundaries. The country was divided into 14 different regions, of which 12 are of interest to this study.

Table 8.1
Natural Agricultural Regions in 1919 According to Statistics Sweden

	Region	Entire Counties	Parts of Counties
1	Skåne' s plains		L, M
2	South Swedish mixed landscape		H, K, L, M
3	South Swedish highland	F, G	M, L, K, E, N, P, R
4	Öland och Gotland	I	H
5	Östergötland's plains		E
6	West Swedish plains		N, O, P, R, S
7	South Bergslagen		E, R, T
8	Mälar och Hjälmar district	B, C, D	T, U, W
9	North Bergslagen		O, P, S, T, U, W
10	Coastland of lower Norrland		X, Y
12	Norrland's mixed landscape		X, Y, AC

Source: Höjer (1921).
Note: See appendix A for a key to the county codes.

In his study of the Swedish Corn market in the 18th century Åmark (1915) identified four surplus regions:

1) A southern region consisting of Malmöhus County (M), the eastern and north western sections of Kristianstad County (L) and a narrow strip along the south eastern coast, including the southern part of the island of Öland, up to the Emå River in Kalmar County (H).

2) The western part of Skaraborg County (R) and a narrow strip from the other counties bordering the shore of Lake Väner.

3) The central part of Östergötland County (E) and the northern section of Jönköping County (F).

4) The valleys of Lake Mälar and Lake Hjälmar, that is to say the northern part of Södermanland County (D), the western part of Örebro County (T), the southern section of Västmanland County (U) and most of Uppsala County (C), excluding the northernmost areas.

In addition to the major cities, Åmark listed the following deficit regions:
1 The highlands of southern Sweden, where agriculture traditionally emphasized animal husbandry.

2 The iron working district of *Bergslagen*.
3 All of northern Sweden.
4 The cities. At the time most Swedish cities were very small, and many of the burghers had fields in the environs where they grew crops for their own needs. Only Stockholm, Gothenburg, Karlskrona and possibly Norrköping were populous enough to require significant outside supplies. [1]

In a lecture to the Royal Academy of Science in 1773 Samuel Hermelin presented figures on regional imbalances in the form of surpluses and deficits.[2] In the absence of reliable data, these numbers can only be considered to be reasonable guesses, and they have generally been acknowledged as such. Hermelin listed four major surplus areas.

Table 8.2
Surpluses by Region in 1773 According to Hermelin

Region	Surplus in barrels
Skåne (L and M Counties)	150000
Lake Mälar valley (B, C and D Counties)	105000
Östergötland (E)	50000
Skaraborg (R)	40000

In addition to the cities and northern Sweden, he identified two major deficit areas: *Bergslagen* and the southern Swedish highlands. The former consisted of parts of Värmland (s), Västmanland (u), Dalecarlia (w) and Gästrikland (x) , while the later included the province Småland and sections of Älvsborg County.

In spite of the three different approaches the overall picture that emerges from them is very similar. At the time Sweden had distinct grain surplus and deficit areas. The plains in Scania, Skaraborg and Östergötland, as well as along the shores of Lakes Mälar and Hjälmar, produced a surplus, while the rest of the country experienced either frequent or permanent deficits. This situation clearly required a geographical reallocation of grain, especially when the crops failed.

Transporting Grain

A basic difference between conditions today and in the Early Modern Period concerns the costs of transportation. In the past transport costs were vastly higher and had a much greater impact on retail prices. In a country such as Sweden, with low population density, goods often had to be shipped over very long distances. Transport conditions were generally considered to be poor. Many contemporary writers complained about the conditions of the roads, but then sometimes added that other parts of Europe were even worse. One advantage of the country's northerly climate was that snow permitted winter transport of grain on sledges. These were much more efficient than wagons. In the winter frozen ground, rivers and lakes also provided straighter and more passable roads than were available during the summer. Thus, it was best to transport grain during the colder

months. In the spring, when thaw turned the roads into mud pits, transport of any kind was especially difficult. Later there would be some improvement when the ground dried out. The long Swedish coastline and the many large lakes, such as the Mälar and Hjälmar, with outlets to the sea, also facilitated long-distance transport.[3] These natural features compensated for the lack of navigable rivers and canals. Relatively close proximity to the principal grain exporting ports of Gdansk, Königsberg and Riga was another Swedish advantage. Thus, in the 18th century, more ships sailed between Riga and Stockholm than between Malmö and Stockholm. The grain from Riga was of much better quality, and the distance it had to be shipped was 50% shorter.

Grain Reallocation

Most of the grain produced in the Early Modern Period was consumed by the peasants who grew it and by their animals. As related above, however, there were both regions with either recurring surpluses or deficits and additional areas that could be plunged into famine by a crop failure. Thus, providing every part of the Country with an adequate supply of grain required the shipment of grain from surplus to deficit regions. In addition to such reallocation over space, it was also possible to reallocate over time by storing grain from bumper harvests to be consumed when the crops failed.

The workings of such a reallocation system were crucial to the efficiency, cohesion and stability of a society. European history is full of examples of the huge social costs resulting from reallocation failures. The process was controlled by social institutions and physical conditions. The analysis of these factors is facilitated if reallocation over time is separated from reallocation over space, that is to say storage from transportation. Both types of reallocation were controlled either by hierarchical compulsion based on law, power and economic dependency on the one hand, or by voluntary actions based on self-interest and co-ordinated by a market on the other hand.

A highly simplified representation of examples of such means is presented below.

Table 8.3

	Hierarchal governed	Spontaneous
Time	Public granaries	Commercial storaging
Space	In kind taxes to the Crown or landlords' rents sold to deficiency areas	Trade

All the various forms of reallocation were governed by institutions. Clearly these had to be more detailed and formally organized under the hierarchical alternative. With the issue of grain reallocation in mind, a brief description first of the hierarchical and then of the market institutions, and their functioning, will follow.

National and Local Governance

The character of the central government regimes varied greatly over the course of the time covered in this study.

1650-72: In 1650, when the grain crises that induced Count Brahe to establish the first *magasins* began, Sweden was effectively governed by a small oligarchy of extremely wealthy landowning members of the high nobility. In practice, they wielded power during the reign of Queen Christina. After her abdication in favour of her cousin Charles X, the new King left them in control during his frequent war-related absences. His early death was then followed by Regency, once again controlled by the oligarchs, during the minority of his son Charles XI. Throughout this period, grain related government activity was limited to the intermittent issuance of export bans on grain from the Baltic provinces.

1672–1719: When the new King, Charles XI, reached his majority, he established himself as an absolute monarch. As such, he instituted the so-called *reduktion*, a radical policy of revoking previous land grants to the nobility. The effect was to return much of their land holdings to the Crown, once again making the State the Country's greatest landowner. These vast grain producing resources, in turn, were largely devoted to establishing a system of compensating soldiers, priests and government officials directly in kind, referred to as *indelningsverket.*

1719–72: The death of Charles XII in 1718 resulted in the end of absolute royal rule. Most, if not all, of the king's power was transferred to the Diet and, to some extent, to the Royal Council. Within the Noble Estate, much of the power of the previously dominant high nobility had already been lost as the result of their much reduced land holdings. The Estate now fell under the principal control of the lesser nobility, especially military officers and government officials. The State Council, which wielded executive power, came to depend on the Diet and, especially, its powerful Secret Committee. The actions of the Council also were circumscribed by the heads of the Administrative Boards and the county governors who often participated directly in Parliamentary activities. A large share of the members of the Estates of both the Nobility and Clergy received much of their income, in kind, from the Crown's land holdings or allotted tax income via *indelningsverket.*

1772–1809: The new young King, Gustav III, seized control of the government and administration, relying on a limited group of trusted servants. In the economic and financial sphere, including grain related policies; his principal advisor was Count Johan Liljencrantz. The power of the Diet was greatly reduced. The new government pursued a very active alcohol, or *aqua vit,* policy. A state monopoly on distilling was established, resulting in large-scale government grain purchases both at home and abroad. In addition, the domestic grain trade was deregulated and variable import tariffs were introduced.

1809–1866: A new constitution divided power between the Crown and the Diet. The roles of the executive and legislative branches were more clearly defined and balanced. The new King, Charles XIV John (Bernadotte), took a

certain interest in grain related policy, not least because of its relationship to the exchange rate. As part of his policy, he obtained the introduction of prohibitive grain tariffs in 1820. These were not removed, and the borders reopened, until the liberalization wave of the 1840s.

The role of the government in Swedish society was shaped by the Country's virtually non-stop wars during the entire 17th century. The Crown's activities, both with regard to people and expenditures, were almost exclusively military. Although wars were less frequent in the next century, the military sector continued to dominate the State.

The Judicial branch was the smallest government sector. The courts consisted of three levels, rising from the local (*ting)* to the Courts of Appeal *(Hovrätter).* Another important government sector was the Administrative Boards. Of these the Board for Public Lands and Funds (*Kammarkollegium*) and the Treasury Board (*Statskontoret)* were most involved in government grain policy. The regional representatives of the central government, the county governors (*landshövdingar*) also called the Royal Commanders *(Konungens befallningshavande*), were of great significance. Their local administrations, whose principal function was to collect central government taxes, consisted of three divisions, the county chancery (*landskansli),* the county office (*landskontor)* and the bailiffs, (*kronofogdar*) each responsible for a bailiwick. To them reported a number of (*länsmän),* constables each responsible for a part of the bailiwick.

The administrative level below the county was the *härad,* an institution of ancient origin. Its size could vary greatly. In Skaraborg County, where most parishes were small, e.g. Vadsbro *härad* consisted of 45 parishes. By contrast, in Dalecarlia (Kopparberg County) a *härad* often corresponded to a single parish. The *härad* meeting, or *ting,* convened three times a year. While originally concerned with numerous issues, by the 18th century it had become focused on court proceedings dealing with criminal offences and civil disputes. The bailiff was required to attend, and the meetings were often combined with tax collection activities. It also served as a forum for the exchange of information between central government and the parish representatives concerning various administrative or political issues. Discussions concerning the establishment of *magasins* took place at many such *ting* meetings in the fall of 1750, but the actual decision to proceed had to be separately taken at each parish's own meeting. The dividing line as regards various activities between parish and *härad* was sometimes unclear, and it probably varied over time and space. Thus, for example, the handling of fire insurance (*brandstod)* varied among *härads* and parishes in different parts of the country and changed over time.

When the parishes originally were established during the middle Ages, they were intended to care for the church building and handle the finances of the local church. Following the Reformation, the Swedish Church became subservient to the King, who appointed the bishops. The Church was thus incorporated into the State administration, but remained independent of other government organizations. The economic resources of the Church and the individual parishes were severely curtailed by the Reformation. Two thirds of the tithes were simply

diverted to the Crown. In return for one of these confiscated thirds that had previously accrued to the parishes, the State provided compensation in the form of what was called a "Wine and Building Grain" payment. It consisted of a fixed amount of grain that, however, was much smaller than what had been taken away. Forsell has calculated that in the 16th century this payment amounted to approximately 1/16 of the crown tithe. Thus the income of the local church that previously had been 1/3 of the total tithe had been reduced to a mere 1/240 of the total calculated harvest.[4] This amount was so small that during the 16th, and the first half of the 17th, centuries, most parishes were in serious financial trouble. The pastor's salary was paid by the remaining third of the tithe and was excluded from the parish accounts.

Lacking a regular tithe income, the parishes looked for other sources of revenue. These included occasional contributions (*sammanskott)* of money, grain or sawn timber. Fees were also charged for funerals, marriages and baptisms. Sin, usually in the form of premarital sex, was also made to contribute in the form of fines. A small percentage of probate inventory values also were paid into the poor relief fund. Maintaining the church building and the vicarage with such very limited resources became a serious problem. Pastors frequently had to call parish meetings to deal with this matter. The oldest parish meeting records concern the approval of accounts. According to Gullstrand (1923) and Johansson (1937), in the course of the 17th and 18th centuries the assemblies gradually resumed their role. In the provinces incorporated into Sweden after the Reformation, during the 17th century, the rules were somewhat different.

As a part of the Swedish State, the Church was not limited to religion in today's narrow sense. The parish also was responsible for most local government services. These included poor relief, care of the sick, primary education, midwifery, vaccination and even fire insurance. In the course of the 18th century, especially its latter part, these activities became more costly and moved to the top of the parish meetings' agenda. The peasants, however, were generally very reluctant to commit themselves to new expenditures, especially if they were recurrent.

Chaired by the pastor, the parish meeting was regulated by the Church Law of 1686. New legislation in 1812 made them mandatory and, later supplemented in 1841 amended the rules. Participation in the meetings was contingent on ownership of a whole or share of a *mantal* unit, and voting rights were proportional to the extent of such holdings. In this respect, they resembled the shareholder meetings of modern corporations. Actual voting, however, was very rare. It was part of the parish meeting culture to delay decisions in the hope of attaining unanimity. The position of tenant peasants, or copyholders, (*frälsebonder*) was unclear. When the landowner's demesne was located in the same parish, the tenants had very little or no influence. It may have been different, however, when the landlord was just a rent recipient living far away. In those parishes where most of the land belonged to a single large estate, the meetings were more informational than decision-making. In such a parish a minority of *mantal* owning and freeholder peasants were in no position to question the decisions of the principal landowner. Although the parish meeting was a form of participatory and representative

governance, by modern standards it was far from democratic.

There thus existed three local forums where the peasantry had a say: the *häradsting,* the parish meeting and the village meeting *(bystämma).* The last of these dealt with practical issues concerning agricultural production at the village level. Compared with the other two, the parish meeting was in a better position to take action. The pastor was normally a full time professional, and there were other elected lay office holders, such as the elders and the church warden (*kyrkvärd).* In addition, there were assets in the form of real estate, including the church building, the vicarage and parish house (*sockenstuga).* Finally, the parish had some income, a church fund and a traditional right to require contributions to construction and refurbishing projects. That same tradition held that all parishioners should participate in the meetings that imposed such obligations. The parish was also a party to negotiations with the bailiff. At the village level there was usually no executive office of any kind.

For the *härad* there was a district judge, *häradshövding,* but he was appointed by the *hovrätt* and was frequently absent. Furthermore, he lacked executive power, and the *härad's* only asset was the *ting* house. The *häradsting* certainly could play a role in facilitating an informative dialogue between the peasantry and central government officials, but the representatives of the various parishes that attended were not empowered to make financial commitments, at least not without extensive consultation with their parish.

In the decree of 1750 concerning the establishment of *magasins,* the King in Council referred to either parish or *härad magasin.* Not surprisingly, as far as I have been able to determine, not a single *härad magasin* was ever established. There were a few cases where two, or even more, parishes established a joint *magasin.* Usually, however, these were small parishes that also shared a common pastor. Furthermore, this was done on an inter parish basis, not by creating a single, super parish, organization. In Dalecarlia, where the parishes are unusually large, the opposite sometimes occurred. That is, there were several *magasins* in the same parish, organized at the village or *fjärding* (one quarter of a parish) level.

The parish meeting had the final say in the management of its *magasin.* All crucial decisions, such as those concerning the establishment of the *magasin,* the contents of its charter, the storage facility and its maintenance, the election of officers, the rate of interest, the selling and lending of grain, the allocation of profits, the acceptance of the accounts and the collection of debts, were made by the meeting.

The Role of the Central Government in the Reallocation of Grain.

The State impacted the flow of grain in several ways, particularly because a large share of its tax revenue was denominated in grain. The most important basis of the tax system was the land tax book *(jordeboksräntan),* which prescribed a long list of in kind tax payments. With the crucial exception of grain, by the 17th century most of these had been commuted into money. Another major component of the tax system was the Crown tithe (2/3 of the total tithe). In some counties vacancy

fees[5] and tenant rents form Crown estates, also paid in grain were collected. The allotment system (*indelningsverket)* was an integral part of the grain reallocation system. It was partly within, and partly outside, the regular tax system. The most common arrangement was that a group of peasants (a *rote)* provided a soldier with a croft. Alternatively, the *rote* had to support the soldier by other means. This was no small burden on the peasants.[6] Officers were granted the right to exploit Crown farms or Demesnes. Another important aspect of the system was that Crown tithes and rents in kind (almost exclusively grain) were assigned not only to institutions, such as hospitals and universities, but also to high ranking officials and officers. These persons obviously received much more grain than was required by their households. They sold the excess, yielding an income that fluctuated in line with grain prices. A similar system existed for pastors. They were granted special vicarage farms, which they usually cultivated themselves. In addition, they received the 1/3 of the tithes that did not accrue to the Crown. Critics frequently commented that some pastors were as interested in the grain trade as in preaching the gospel.

Much of the Crown's income and expenditures were thus protected against inflation since they were in kind. This circumstance may help explain why, as was noted in chapter 2, the Swedish currency and coinage suffered devaluations more frequently than that of many other countries. In a country with taxes denominated in money, the cost to the State of devaluations would have been much greater.

Much of the Crown's grain was thus distributed directly from paying peasants to numerous individuals and institutions to whom the grain was an allotted income within the *indelningsverket* system. They and the taxpayers who directly provided their grain could decide whether it was to be delivered in kind or be converted into money in accordance with the market scale prices that were established on a county basis in the late autumn of each year. If payment was to be in kind, the recipient was entitled to delivery at any location of his choosing within the *lagsaga* (a judicial district consisting of 1–2 counties). Thus, he could sell the grain to an iron works, either directly or through an intermediary, and then require the peasant payee to deliver it to the buyer. In effect, this wholesale trade in grain originating with relatively frequent in kind payments functioned in a simple way with little administration. At the time this was no doubt advantageous, given Sweden's undeveloped economy. On the other hand, the system inhibited the emergence of organized trade, where the peasants could sell grain to specialized merchants. These, in turn, would have transported the grain to central storage facilities from where it could be sold and distributed. The existing system thus constituted a threshold that must be surpassed before a market could be established thereby failing to provide an outlet for any additional amounts that the peasants wished to sell. It weakened the incentives for the peasants to increase production for sales.

The grain that was paid to the Crown was placed in government storehouses. From there, it was either used to support the local military establishment or else was shipped elsewhere, again most likely for military use. The system clearly involved some degree of centralized grain storage, but there was no explicit intention to influence the market.

The description in chapter 6 of the political lead up to the establishment of the *magasin* included several examples of proposals in the Diet during the Age of Liberty calling for the government to undertake policies intended to stabilize grain prices. These proposals often were submitted by military officers who were recipients of in kind (grain) taxes although consistently rejected with reference to lack of financial means. Government intervention in grain markets was by no means an original Swedish idea. On the contrary, both Fredrick the Great of Prussia and Empress Catherine of Russia pursued government grain storage policies that they bragged put "grain prices in my hand", although the effectiveness of their actions is open to question. What is clear, however, is that a country such as Sweden, with continual access to imported grain, was hardly an ideal candidate for such policies.

Starting in the late 1770s, however, there was an episode deserving more thorough exploration than can be provided here. As an important component of his active *aqua vit* policy, where distilling became a state monopoly, King Gustaf III involved the Crown in the large-scale purchase of grain, both domestically and abroad. Even after the privatization of the Crown's distilling activities, grain trading continued under the auspices of the General Magazine Directorate until the 1820s. At that point, sharply falling grain prices caused huge losses in the value of the large amounts of stored grain that had been purchased to support the market after bumper harvests around 1820, resulting in a major political scandal. Unfortunately, the torrent of criticism unleashed by that failure has washed away whatever positive comments the system had previously received. Of course, some merchants had complained that the Crown's trading activities impeded the development of a free market for gain. Other observers, however, felt otherwise. There is much anecdotal evidence that the peasantry was happy to have an opportunity to sell surplus grain to the government at a predetermined price. Åmark quotes several county governors who expressed their satisfaction that the peasants were being provided with a certain opportunity to sell their surplus grain at a market-determined, but fixed, price. He himself concluded that the outlet provided by the large-scale purchases of domestic grain promoted agricultural development. It is also interesting to note that Swedish grain production which, according to Gadd (2000), had been stagnating for decades, started to increase only a few years after the Directorate began its large-scale purchases. As also noted by Åmark, price volatility also decreased. In fact, it now became significantly lower than in other major European cities, and remained so as long as the Directorate's activities continued. When these ceased, however, Stockholm's lower grain price volatility also went away.[7] The unusually stable prices of the period, while not proof of such a conjecture, are at least consistent with it. Furthermore, Utterström does not reject the Directorate's claim that it could use modest means to increase seemingly low prices.[8] More data and analyses, however, are required before the history of the Directorate can be re-evaluated. Still, these observations do suggest that it is a topic worth further study.

The Grain Market

Despite its notoriety, the General Magazine Directorate episode was an exception. Most shipments of grain from surplus to deficit areas were the result of market transactions. The three principal deficit areas were the iron works district *Bergslagen*, the major cities and the southern Swedish highlands. In each case the process of reallocating grain differed somewhat.

There was probably much less organized large-scale trade in grain in the southern deficit area than in the cities or *Bergslagen*. The population was widely scattered, and the border with neighbouring surplus areas was long. There is much anecdotal evidence of the inhabitants of the forested areas descending to the plains to trade their forest and animal products for grain. There were also fairs, such as the one in the city of Borås, which provided a reasonably sure outlet for grain. This trade was far less organized than, and the resulting prices much less integrated with, the major grain markets than was the case with *Bergslagen*.

Through their purchases the iron works covered the more or less permanent grain deficit in *Bergslagen*. They frequently acted as grain retailers, not just for their employees, but also for much of the surrounding population. To this end the works often had large storehouses. Despite an increasing tendency during the 19th century for them to produce their own grain, the iron works remained dependent on large-scale purchases. The iron masters were in regular contact with the merchants from Stockholm or Gothenburg who handled the exportation of their iron. These merchants were generally well-informed concerning world grain prices. It is therefore reasonable to suppose that the iron masters were better-informed and more capable buyers of grain than were many other actors. It is possible to distinguish at least three different sources for their grain purchases. The first was Stockholm merchants and the second was large landowners and major recipients of allotted taxes and tithes. Lindgren (1971) provides a detailed description of how one of these recipients, Uppsala University, sold its grain to large customers. Such transactions could be negotiated directly between the parties, with a factor or merchant from Mälar cities such as Västerås acting as middleman. The third possibility was to buy many smaller amounts from neighbouring peasants, either at the regional fairs that were held at regular intervals or directly from the producer. The latter alternative was particularly convenient when the peasants appeared at the works with horse and wagon to transport iron bars to the Lake Mälar ports.

There are good reasons to believe that this trade was carried on in a way similar to that of a well- functioning competitive market. This may provide a good explanation for why *Bergslagen* grain prices, including those in the interior forests, followed the fluctuations of the world prices closer than those in the rest of the Country. (See chapter 5).

In chapter 5 it was shown that there was no strong price integration between various parts of Sweden in the 17th and 18th centuries and that the similarities in price movements that could be observed probably originated in imports from the

same world market. When did Sweden then become a more integrated market? That the process started in the beginning of the 19th century seems clear with increasing volumes of grain being shipped from ports in Scania to other parts of the country. An attempt to quantify the development is made in Figure 8.1, which is based on the areas included in Jörberg (1972a). They correspond to the various counties although, in a few cases, counties are subdivided. The upper curve displays the dispersion of absolute price differentials over time among the various areas. The lower curve measures the covariation of prices over time.

Both curves reveal three phases. The first is a downward sloping trend lasting until the 1780s. It displays an increasing uniformity in both the levels and variations of prices, reflecting that imports became more wide-spread. The second phase is trend less, but with substantial fluctuations. The third, commencing shortly after 1820, consists of a clear downward sloping trend for both indices. It was only from this point a more widespread domestic integration began to emerge. The development of the integration measured in this way appears as a steady and gradual process, which may be natural taking into regard that it was influenced by a number of various factors.

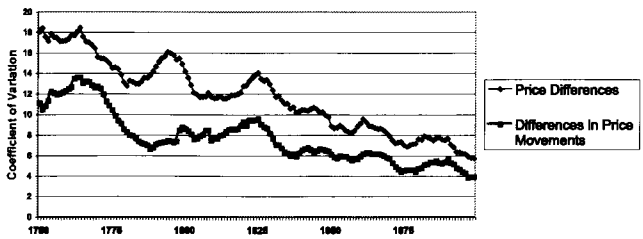


Figure 8.1

Price Difference and Differences in Price Movements 1747–1909.
Rye. Market Scale Prices for Counties.

Note: "Price Differences" is measured by the coefficient of variation of the market scale prices of all counties. In order to smooth the curve and emphasize the trend, a centered moving average of these annual CVs has been used. "Differences in Price Movements" is calculated in the following way. For each county, an index of the price in a given year relative to the average for the 11 preceding years was calculated, thus indicating the deviations from the trend of that county. The dispersion of these index values is measured by the annual coefficient of variation, here smoothed as a centered moving average in the same way as for "Price Differences".
Source: Jörberg (1972a)

Storage

It is possible to identify three types of actors who might have been interested in the large-scale commercial storage of grain: estate owners, merchants and major buyers. Nonetheless, there is virtually no evidence of any significant private commercial grain storage in Sweden during the 17th, 18th or early 19th centuries.

Large demesnes certainly had the capability to store grain from year to year. The most likely scenario for putting grain in storage would be a year with bumper crops and exceptionally low prices. Under such conditions, it could be difficult to find buyers, and only at unattractive prices. It would then be reasonable to expect actors to postpone selling until prices recovered.

It is possible to use stylized facts, based on available statistical data, to analyze such storage opportunities. Years when prices were extremely low compared to the previous eleven years (25%, alternatively 15% lower) have been selected, and then compared with actual prices the following year. Such a procedure permits the expected (average) one year price gain from putting low priced grain into storage to be estimated. Table 8.4 contains such data based on Stockholm prices.

Table 8.4
Potential Gains from Storage.

	Years when the price in relation to the average for the 11 preceding years was	
	-25% or less	-15% or less
	Price increase in % to the following year (median value)	
1610-1719	17	8
1720-1775	26	12
1776-1815	3.5	3.5
1815-1899	5	6

To calculate the expected profit, however, storage costs in the form of interest, handling costs and losses in terms of quality, weight and volume must be deducted from the potential price gains. Such costs amounted to at least 10% per annum, and probably more. It is apparent that speculative storage could, as a rule, only have been profitable before 1775. Even then it was limited to some exceptional years when prices were at least 25% lower than the average for the preceding 11 years. It must be concluded that the actual pattern of year-to-year price fluctuations very seldom would have made commercial storage profitable. This result fits well with the available information indicating that grain storage on large estates was an infrequent event.

This analysis applies equally well to consumers. Most large-scale consumers, including bakers and brewers, did not have the capacity to store large volumes of grain from year to year. The iron works may have been an exception. When prices were low, they also were more likely to have the capital required to purchase extra supplies for future consumption.

With the possible exception of some stirrings in Scania, one type of storage was entirely absent during the 18th century. There were no merchants who accumulated grain for future export or shipment to other parts of the Country by making purchases from many small peasants. This variant of the grain trade did not emerge until later in the 19th century. With hindsight, it is clear that this absence created a serious problem for the peasants.

The Small Peasants and the Market

The previous discussion indicates that the market relationship between major producers and rent recipients on the one hand, and large-scale buyers on the other hand, may have functioned in a fairly simple way for the two parties. The situation for small and medium sized producers, however, was more problematic.

Some of their production became part of large-scale transactions through the tax, rent and tithe systems, but they played no direct role in that activity. They simply delivered the grain.

The peasants were often criticized for not focusing sufficiently on grain production. Instead they devoted much of their time to other, presumably less productive, activities. These included the provision of travel and transport services, fresh water fishing, tar and charcoal burning, distilling *aqua vit*, and various handicrafts. In fact, however, these activities made good sense. The seasonal aspects of agricultural work, with peak period at sowing and harvesting, left them with intervals of free time. Moreover, these non-agricultural activities provided a monetary income that could be used for taxes and grain purchases, especially when the harvest failed. The alternatives, such as land reclamation, intended to increase long-run grain production capacity, were not particularly attractive in the absence of a reliable market outlet for the additional grain.

The small peasant faced a number of problems when he turned to the market. Lack of information, trust and liquidity all limited the extent to which he could take advantage of surplus grain. With his intermittent and highly variable volumes of saleable grain, he had to consider three important issues before setting out to market his grain:

- How confidant was he of finding an outlet for his product?
- How could he secure a fair price?
- How could he obtain payment in a form that was both safe and sufficiently liquid for his needs?

The local market was limited in scope and, since harvest yields were correlated in a given small area, the peasants were likely to face a saturated market when their crops were good and a general shortage when they were bad.

An ideal trading system would resemble that sketched in figure 8.2. A number of producers, P_1, P_2 and P_3, sell their grain to a merchant who accumulates it for eventual shipment to a merchant in another city, who then distributes it to customers C_1, C_2 and C_3. The absence of the left hand part of such a system, however, necessitated some alternative solution.

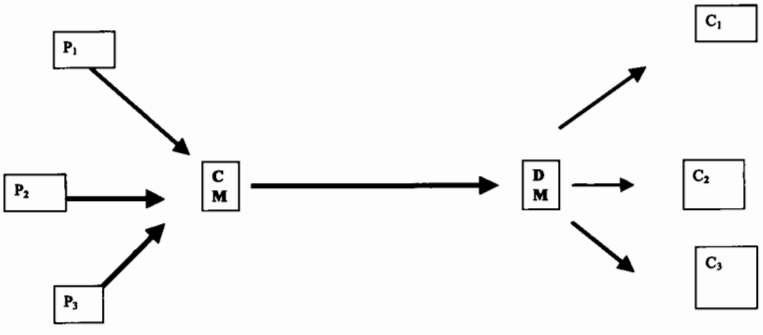


Figure 8.2
Market Structure

Peasants living on the plains, but in reasonable proximity to a forested deficit area, were in a position to barter with the residents of the latter. They could exchange grain for wood or animal husbandry products such as butter. There are numerous accounts of peasants from the grain surplus plains of Scania, Västergötland and Öland, engaging in such bartering with their compatriots from the southern highlands.

Another possibility was to deliver grain directly to an urban general retailer. The autumn grain could then serve as payment for the peasant's year round purchases of items such as salt and iron. Such retailers were in cities where the local market often was very limited, however, and they were unlikely to be interested in receiving more grain than was required to cover the peasant's outstanding debts. They would be constrained both by a lack of storage capacity and a shortage of capital, especially to finance such a risky trade. In the absence of vigorous competition, such dealings also would have exposed the peasant to the risk of high commodity purchase prices and low grain sales prices. Contemporary literature is full of cautionary anecdotes concerning peasants who became dependent on a single merchant.

To some extent, the iron mills may have purchased small amounts of grain from individual peasants living in nearby parishes in Västmanland, Närke and parts of Södermanland and Östergötland. Such transactions could occur at local fairs or through city merchants. Because of their proximity to the iron district, such peasants were able to establish lasting relationships with people living there, thus facilitating the sale of the limited quantities of grain they had available. Living close to *Bergslagen,* they were better informed concerning market opportunities and competitive price levels than were more distant peasants.

There are numerous references to the advantages enjoyed by the peasants living close to *Bergslagen.* In a 1740 report the *Kammarkollegium* noted that they benefited from being able to sell their crops at prices higher than those offered at the Crown storehouses.[9] The small peasant living in that region, who had occasional small surpluses to sell, had better market access than had those who lived elsewhere and his trading was facilitated by their frequent participation in the transportation of refined iron from the iron works to the ports on Lake Mälar.

Eighty years later, in 1822, the county governor of Västmanland echoed this opinion. In his five-year report, he observed that the peasants living in the vicinity of the city of Sala did not bring their grain to the local market. Instead, they found it more profitable to transport it to the iron works district. He also observed that the peasants from the northern bailiwick of Västerås drove "their wagons to Bergslagen virtually year round" to sell their grain there. Not only did they receive a higher price, but they also had the opportunity to get a return cargo. By 1844, however, the governor was reporting that the peasants' market in the iron district had shrunk considerably as a result of increased production there.[10]

In that same year of 1822, however, the situation in Uppsala County was painted in more sombre tones. The governor reported that the works in the Dannemora iron district, which once had required large quantities of grain, thus providing the county's peasants with a favourable and convenient market, now produced

enough grain to cover their own needs. Moreover, the city of Uppsala produced sufficient grain on its excellent land that there was little demand for additional supplies from outside sources. The sell his grain on reasonable terms, the governor complained, the peasant now had to transport it as far as 16, or even 20, Swedish miles (1 Swedish mile = 10 kilometres = 6.3 English miles) away, handicapped by weak draught animals and a lack of fodder. With few if any local purchasers, the peasant had to come up with marketing ideas on his own and then transport the grain himself. The governor saw this situation as a serious impediment to the improvement of agriculture and the enrichment of the cultivators.[11]

The importance the peasantry placed on the distilling of alcohol was also related to the lack of outlets for their excess grain. Compared to grain, alcohol was in many regards a superior product. It had higher value added, it was easier to transport, to store and to market and it yielded by-products that could serve as, otherwise scarce, animal feed.

Market problems were thus a serious obstacle to increases in peasant grain production. It is understandable that the peasants did not give the highest priority to maximizing grain production as long as they lacked dependable outlets. Originally, the system of in kind taxes worked well in channelling the peasants' surplus grain into the market. When, during the 18th century, production increased while taxes, tithes and rents remained constant, however, the lack of established marketing channels became a problem. The existing institutions worked well as long as self-sufficiency dominated. When production later increased, however, they became an obstacle to growth and agricultural commercialization.

The peasantry obviously had to store grain during the year and, in the case of rye, the following year's seed from late summer one year until early autumn the next. Little, however, is known of the year-to-year storage practices of small and medium sized peasants. That individual households maintained substantial amounts of grain in reserve for possible crop failures, however, seems unlikely. There is no evidence whatsoever of such behaviour in reports or probate records. There might, of course, have been rare individual cases where low prices induced a peasant with sufficient liquidity to defer selling until conditions improved. Given the chronic liquidity shortage suffered by the peasants, however, that cannot have happened very often. As related in chapter three, in some parishes a portion of the peasants experienced autocorrelation in harvest yields, never for rye, but sometimes for barley. This might be the result of a situation where part of an unusually good harvest was stored as "extra" seed for the following year. That, in turn, would result in greater output than otherwise would have been the case. Another alternative explanation for the observed autocorrelation could, however, be that poor harvests resulted in less seed used the following year. Verifying any such hypothesis, however, requires more research than I can undertake here.

The *magasin* loans can be examined from this storage perspective. They can be seen as providing, or selling, storage services to the peasant. He borrowed grain when he had a deficit and repaid it when he had a surplus, thus reducing his own need to store grain or to sell and then repurchase grain with high transaction costs. This behaviour explains both why most loans exceeded a year in duration,

and why the level of amortization payments was the variable most sensitive to harvest and price fluctuations.

Testing the Three Hypotheses

Hierarchical Aspects

The first hypothesis listed at the beginning of this chapter was that the establishment of *magasins* required hierarchical action. That is to say, an initiative that originated well above the parish level. During the Age of Liberty the Diet and the State Council, as well as the King personally in 1803, took such initiatives. Directives were dispatched to the county governors urging them to act. They, in turn, instructed the bailiffs to make "feasible proposals" (*tienliga föreställningar)* that would win the support of the parishioners. Sometimes the diocesan consistory was asked to urge the pastors to lead the way in their parish. The minutes of the *ting* meetings indicate that the county governors on occasion tried to convince prominent upper class persons (*ståndspersoner)* in the parishes to take the initiative, or at least to argue in favour of establishing a *magasin.* (See chapter 6). Even if it is true that an initiative from above was required to make the peasants provide the initial capital, however, by itself it was certainly insufficient. Other favourable factors were required if anything practical was to happen. In particular, timing was crucial. It certainly was easier to persuade the inherently reluctant peasants to chip in after a good harvest, when surplus grain was available, than after a poor crop when many had a need to buy grain.

Prior to 1680 the question of establishing a parish *magasin* was entirely in the hands of the large landowners. If, as is possible, there were cases in addition to Visingsö, nothing is known of them today. During Charles XI's absolutist regime (1672–97) the attention of the Crown was focused on the implementation of first the *reduktion* and then on the allocation system (*indelningsverket).* During the reign of the next monarch, Charles XII, the war-related demands of the State were so great that any push for parish *magasins* would have been viewed with great suspicion and fear of confiscation.

The attempts made in Finland during the 1720s obviously survived only briefly. The Parliamentary efforts of the 1730s and 1740s fared only slightly better. A few scattered parish *magasins* resulted, although there is reason to believe there may be a few more that have vanished from the historical record. There is, however, little to be gained from a systematic study of the limited information available from these decades. Only starting in 1750 such an effort is worthwhile.

A Time Series of Parish *Magasin* Establishments: The Role of the Central Government

Chapter 6 gives an account of three different central government initiatives to promote the creation of Parish *magasins*. These were undertaken in August 1750, February 1757 and 1803. Figure 8.3 below displays the number of *magasins* established during the entire period studied. Three very clear peaks are evident in 1750, 1759 and 1804. Four additional, less pronounced but identifiable, peaks occurred in 1764, 1774, 1784 and 1814.

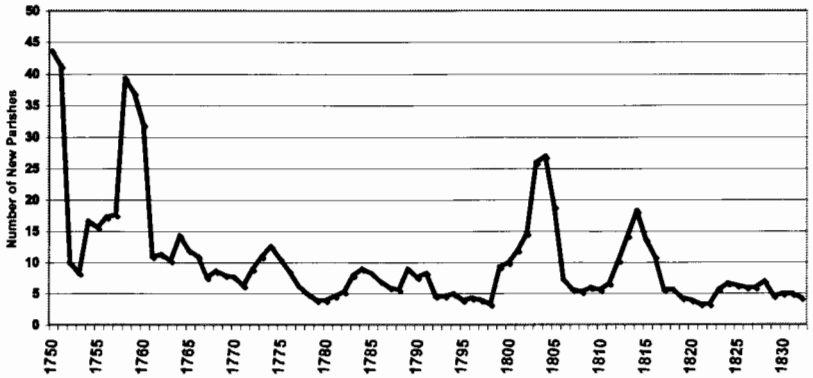


Figure 8.3

Number of Parish *Magasins* Established 1750–1830. Three-Year Moving Average.

Note: The data has been smoothed by the use of a centered three year moving average. This procedure is also appropriate considering that the establishment year is not always clear or comparable. The year of record might be either the year the *magasin* was approved by the parish assembly, the year the initial grain deliveries were made or the year the charter received royal approval. These various dates could easily be spread over one or more years.

Before or during the four years with secondary peaks no nation wide initiatives were undertaken. Moreover, a close examination reveals that activity was largely limited to one or a few counties. Thus, it seems likely that these establishment clusters reflected the activities of one or a few county governors.

The success of the 1750 Royal missive encouraging the establishment of *magasins*, especially compared to the failure of earlier attempts, was unquestionably a by-product of the bumper harvest and low prices of that year. Quite simply, it was much easier to convince the peasants to contribute grain when it was plentiful and difficult to sell and thus having a very low opportunity cost. The Royal circular of December 1757, with its "manual" for charters and accounting procedures, coming on the heels of a poor harvest and high prices, had very little immediate effect. But two ensuing years of bumper crops and low prices, however, were accompanied by a major increase in the number of *magasin* establishments. There thus seems to be a clear connection between central government initiatives and *magasin* establishments, with the proviso that the effect had to wait for a favourable market situation. This conclusion also holds for the King's personal

initiative of 1803. By contrast, in the absence of government encouragement, the low prices of 1791 had no such effect. Thus, it seems clear that both hierarchical initiatives and favourable market conditions were needed. One without the other was insufficient.

Åmark argued that serious harvest failures, when they had been overcome, encouraged the establishment of parish *magasins*. The painful experience would have demonstrated the need for grain storage. Evidence for this proposition, however, is hard to come by. The price peaks of 1771, and 1785 and 1786 had no discernable general effect on the rate of new establishments. Some general connection, however, might be inferred from the very high prices of the first decade of the 19th century being accompanied by numerous establishments and a strong demand for loans. Conversely, the 1820s, when prices were falling, witnessed a decline in both new establishments and loan demand.

Hierarchical or Local Initiatives?

A simple attempt has been made to utilize the data, presented in chapter 6, on the year in which each parish established a *magasin* to determine whether the initiative was local or hierarchical. All the parishes for which the year of establishment is known were divided into four categories. Hierarchical initiatives are those emanating directly from the central government or from the county governors. The four groupings are based on the likelihood that such outside initiatives played a crucial role.

E = Evident. This category includes nearly all parish *magasins* established during the 1750s, when the two Royal circulars were issued. It includes all parish *magasins* that were part of a group of at least eleven establishments within a ten-year span in a single county. In these cases it is assumed that the county governor played a decisive role.

Pr = Probable. This category includes all parish *magasins* that were part of a group of at least five establishments within a ten-year span in a single bailiwick.

Po = Possible. This category includes all parish *magasins* that were part of a group of at least two establishments within a ten-year span in a single bailiwick.

U = Unlikely. This category includes all parish *magasins* that were the only *magasin* established within a ten-year span in a single bailiwick.

These definitions are clearly arbitrary and can be questioned. Moreover, they cannot reliably be applied to the case of any particular parish *magasin*. Nevertheless, they may be good enough to provide an indication of to what extent the establishments of *magasins* were the result of pressure from higher authority. The results are displayed in figure 8.4. Two thirds of the establishments are classified as Evident with an additional 4% being in the Probable category. The remaining 30% consisted of 11% Possible and 18% Unlikely. The latter category includes many cases where there was a pre-existing *magasin* in the vicinity, a circumstance making local initiative more likely.

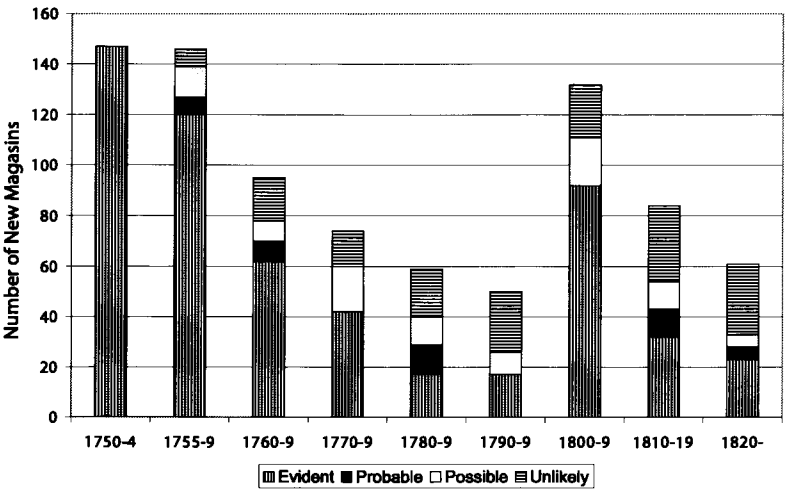


Figure 8.4
Hierarchically Initiated Parish *Magasin* Establishments.

That hierarchical initiatives dominated the 1750s is true by definition. The diagram also suggests that the Royal initiative of 1803 also had an effect. Conversely, the indifference displayed by the Finance Minister, Count Liljencrantz, and his successors in the 1780s and 1790s was accompanied by a lack of activity. To the extent that establishments from that period are classified as resulting from hierarchical initiatives, it was the work of an individual county governor. Throughout the period from the 1760s to the 1820s, the number of cases credited primarily to local initiatives was limited, but rather stable.

The Bailiwick Organization

The wishes and instructions of the central government had to be implemented at the regional level by the county governors. During the 18th century, however, the county governors typically had a very small staff. Long distances and poor communications within the counties meant that their contact with the rural population was limited. The bailiff was the only government official who maintained close contact with both the parishes and the governor, to whom he reported. When serious persuasion was required to convince reluctant or dubious peasants, the bailiff was best suited to the task. Thus it was usually he who conveyed the "feasible proposals". His ability to succeed in these efforts, however, varied among counties. It depended on the size of his bailiwick, as well as the circumstances surrounding his most important task, collecting taxes. It is certainly reasonable to suppose that one important aspect of the bailiff's ability to sway the various parish meetings was the number of parishes he had to convince.

Table 8.5
Number of Bailiwicks and Parishes by County.

		Number of			
County	CountyCode	Bailiwicks	Härad	Parishes	Parishes per bailiwick
Stockholm	B	8	17	112	14
Uppsala	C	6	12	86	14
Södermanland	D	5	10	90	18
Östergötland	E	8	20	151	19
Jönköping	F	6	9	123	20.5
Kronoberg	G	4	6	84	21
Kalmar	H	6	7	92	15
Gotland	I	2	2	91	45
Blekinge	K	2	4	28	14
Kristianstad	L	4	10	147	37
Malmö	M	5	13	241	48
Halland	N	4	10	86	21.5
Bohus	O	5	20	85	17
Älvsborg	P	6	18	217	36
Skaraborg	R	5	14	214	43
Värmland	S	5	14	82	16
Örebro	T	4	16	57	14
Västmanland	U	7	12	68	10
Kopparberg	W	7		44	6
Gävleborg	X	8		45	15

The table 8.5 indicates that the two counties with the fewest parishes per bailiwick, Västmanland and Kopparberg, were also the ones that responded most quickly to the State Council's order in 1750 that parish *magasins* be established. It is also easy to understand that a bailiff would have difficulties in discussing and debating at length with, and eventually convincing, a group of reluctant and suspicious peasants, if he had 30 or 40 different parishes on his schedule. Other counties with many establishments at an early stage were Uppsala, Södermanland, Örebro and Gävleborg which all had comparatively few parishes per bailiwick. Gotlands is, however, an exception.

Tithe Barns

Reluctant peasants frequently used the lack of adequate storage facilities as an argument (or perhaps an excuse) against the establishment of a parish *magasin*. Against this background the availability of a tithe barn could facilitate a quick and favourable decision. At the time the crown tithe was introduced, the parishes were required to provide a barn where the tithe grain could be collected and stored after it was threshed. From there the bailiff and his men could distribute or transport it as required. The barns were linked to the variable tithe system which was based on the counting of stokes in the field and sample threshing. According to the Law of 1734 "Church or tithe barns, where needed, are to be built by all those in the parish or city who pay the Crown tithe". It then went on to observe that "in most places

the tithe barns have now ceased, since fixed tithes per farm have instead been enacted".[12] The prospect of using an existing barn was naturally attractive when the alternative was new construction.

In some of the counties where parish *magasins* were established early on, the tithe barns might have played a role. In Västmanland County most parishes shifted from variable to fixed tithes at mid 18th century. In 1750 there were 33 of the County's parishes, which had fixed tithes, while 29 retained the old variable system. Nine of the latter, however, changed over that very year.[13] The Säter bailiwick in Dalecarlia still had variable tithes, but Stora Tuna, the largest parish in Dalecarlia, converted in 1753.[14] In the Västernärke bailiwick variable tithes continued until 1727, except for the parish of Tångeråas, where they continued for another decade.[15] According to Lindgren (1971), the variable tithes allocated to Uppsala University had been converted in eastern Uppland by 1729 (they were definitively gone by 1742), in Hälsingland definitively by 1752 and in Börje and Näs parishes outside Uppsala by 1759. The four allocated parishes in Västmanland, however, did not convert until the 1760s and 1770s[16]. In other parts of the Country, however, the tithe barns were either insignificant or nonexistent mainly because the fixed crown tithes had been introduced much earlier. Thus, tithe barns were not a possibility there.

Estates

On basis of his study of parish meetings in three different locations, Tiscornia (1992) has concluded that the presence of a large estate was of crucial importance. In parishes where a single large estate owned most of the land, decision-making was dominated by the landlord, even in his absence. Lacking the ability to influence the result, the peasants were reduced to passivity and little discussion took place. In one of the parishes that Tiscornia studied, Stora Malm, the decision to establish a *magasin* was entirely in the hands of the lord of the Ericsberg estate with his controlling voting power in the parish meeting. The required contributions to the *magasin's* initial capital were viewed by the peasants as an additional rental payment, which they naturally opposed.[17] Thus, a dominant landlord was able to impose expenditures on, for example, a poor house or a school, and then require all the parishioners to pay for it in proportion to their *mantal.* According to Tiscornia, there was much more open discussion in parishes free of dominance by a single large estate or landlord. That, of course, does not mean that there was more disagreement in such parishes. It was simply that there was no point in having discussions in parishes where the peasants had no influence on the outcome.

In this context, did the share of estate land in a parish affect how quickly a *magasin* was established? The percentage of estate *mantal* has been calculated on a county basis by Carlsson (1973). In eastern Sweden the estate share varied greatly, from 0% in Kopparberg and Gävleborg Counties to approximately 15% in Södermanland and Stockholm Counties. Uppsala, Västmanland and Östergötland Counties were below the national average of 10%, while Skaraborg County was above. Among the more peripheral counties, Jönköping was above the average, but Kronoberg, Calmar, Älvsborg and Värmland were below. The percentage of estate *mantal* at

the county level has obviously no discernible explanatory power for when and in which counties parish *magasins* were established. Differences within counties are more promising. Based on Enequist's study of four Mälar valley counties, it is possible to distinguish parishes with a high percentage of estate land from those with a low percentage. At this level the relationship with *magasins* becomes clear. Parishes with more than 50% estate land were unquestionably impacted.

Table 8.6
Share of Estate Land and the Existence of *Magasins* in the Four Lake Mälar Counties.

Share of estates mantal of the parish total	Number of parishes in the B, C, D and U counties		Share of parishes with Magasins %
	With Magasins	Without Magasins	
>50%	25	23	52.1
25-50%	64	13	83.1
10-25%	69	16	81.2
0.1-10%	43	4	91.5
0%	72	15	82.8

Source: Enequist (1975); Parish list

The dividing line seems to run at approximately 50% estate land. How far below that level a parish fell makes little or no difference. Within the high estate land group, however, there were clear differences between counties. In Stockholm County (B), only 4 out of a total of 20 parishes with more than 50% estate land had *magasins*, as opposed to 13 out of 15 such parishes in Södermanland County (D). The contrast is even greater for parishes with more than 75% estate land. Of four such totally estate dominated parishes in Stockholm County, none had a *magasin*. By contrast in Södermanland County five out of seven had a *magasin*, four of them having been established in the 1750s. Thus, it seems as if estate owners in Södermanland County supported the creation of *magasins*, while those in Stockholm County were opposed.

Table 8.7
Number Parishes in the Lake Mälar Counties with a High Percentage of Estate Land Having *Magasins*.

Number of Parishes with a high share Estate Land with and without Magasins in the lake Mälar valley counties.								
County	B		C		D		U	
Estates in % of total mantal in the parish	with	without	with	without	with	without	with	without
75-99%	0	5	0	0	5	2	1	0
50-75%	4	11	5	3	8	2	1	0

Source: See table 8.6

On the Södertörn peninsula, located south and south west of Stockholm, there was not a single parish *magasin*. They were also very rare along the shore of Lake Mälar immediately north and west of Stockholm in the direction of Enköping. These were estate dominated areas. Island parishes, such as Utö and Mörkö, which were controlled by a single estate, had no parish *magasins*. The largest estate in

Sweden, Ericsberg, was located in the parish of Stora Malm in Södermanland County. There a *magasin* had been established in the early 1750s. Initially, it had grown very quickly, but suddenly in the 1780s it ceased operations. This closure was probably the result of conflict with another smaller estate in the parish.

The impact of large estates on the formation of *magasins* was clearly ambiguous. When the landlord was in favour, the process would be accelerated. Such an effect is confirmed by minutes from *ting* and parish assemblies in Södermanland and Västmanland Counties. The part of Södermanland County where estates were most common is also the area where most parishes established *magasins* in the 1750s. If the owner was disinterested in establishing a *magasin*, or left his steward in charge but without instructions, however, the presence of an estate could slow the process. In some cases an estate performed itself the functions of a *magasin* for its tenants and subordinate crofters. Some parish *magasins* in Södermanland County were of this type. Thus, dominant estates certainly had a major impact, but it could go either way.

Centre Versus Periphery

Even a glance at the maps and figures displaying the location and establishment date of parish *magasins* makes it clear that the areas close to, but not immediately adjacent to, the city of Stockholm led the way. Clearly, the *magasins* spread, step by step, to areas further and further away from the Capital. When distance from Stockholm to the county seat is correlated with the percentage of parishes having *magasins*, the resulting coefficients are 0.50 for 1770 and 0.77 for 1830. One possible interpretation of this result is that, in a society with poor communications, the ability of the hierarchical central power to exercise control diminished with distance.

Table 8.8
Distance from Stockholm.

County	Distance from County Capital to Stockholm, km	Share of parishes with *Magasins* 1770	Share of parishes with *Magasins* 1830	Year of establishment Median Value
B	0	17.7	59.9	1774
C	69	57.5	87.3	1758
D	103	52.8	86.2	1765
U	106	91.6	91.6	1750
X	174	82	94.9	1757
T	195	55	70.9	1760
E	201	10	81.3	1800
W	222	86	89.9	1751
S	306	14.4	37.2	1804
F	329	8.3	43.1	1808
R	349	29.4	58.4	1786
H	408	3.7	50.5	1812
P	413	5.5	18.3	1828
G	422	2.2	17.4	1813

Source: Parish list

Motivating Forces

The previous chapters have described how the once reluctant or indifferent parishioners not only established but even continued to run their *magasins* during long periods. Even if there sometimes were efforts from central power representatives (county governors) to influence the activities, it is quite clear that the *magasins* were not mandatory nor governed from any force outside the parish. This means that the parishioners must have had other incentives and it is difficult to imagine that a mere storehouse full of grain, as a reserve for some difficult year in the future, would have been such a force. Storage was very costly and as was shown in table 8.4 very seldom commercially viable. It goes without saying the parish magasin was unable to influence the price level. The rather general availability of imports meant that apart from a few exceptional years there was no physical lack of grain although high prices could prevent poorer people from buying enough. The problem was rather what Sen (1981) has expressed as a lack of entitlements than of grain. All this leads to the hypothesis that it was the profits that the magasins could generate and their use that formed the incentive for the parishioners.

Once a *magasin* had been established, the initial policy usually was to let it grow as fast as possible by reinvesting the interest earned. Thanks to compounding, the capital could double in six years. Once the grain fund had reached some desired level, however, and especially if all the grain available could not be lent on good terms, further accumulation stopped. At this point the question of how to dispose of the surplus had to be decided. One frequently adopted alternative was to repay the initial capital to the contributors. In fact, this possibility was envisaged in the "handbook" for the *magasins*, which the Government sent out in 1757. As reported in chapter 7, there were even cases where the original capital was returned more than once.

The care of the poor was absorbing more and more of the parishes' resources. The ancient medieval regional laws had once required that a portion of the tithes be devoted to poor relief. When the Reformation deprived the parishes of their tithe income, they no longer had the revenues required to assist the poor. In many cases their only recourse was to license betting and to issue permits for beggars. In 1642 the government issued regulations for beggars that instructed the parishes to provide a cabin next to the church to serve as a poor house. Since there was no enforcement, however, few parishes provided such a facility. Starting in 1751 the government allocated a portion of its income from fines to the parishes, as well as allowing them to charge fees for services such as weddings.

The division of responsibility for poor relief between the state and the parishes was clarified in the 1760s. Care of the sick, childcare, asylums for the mentally ill and hospitals for those with contagious illnesses were the responsibility of the State. All other needs remained with the parishes. In principle, each parish was required to feed its own poor, although it could decide for itself how to do so. During the 18th century real wages declined and the ranks of the poor expanded. Although the legislation did not mandate particular measures, pressure for action increased both from above and below, as did the need for additional resources. During the

early decades of the 19th century the question of a general poor law, that specified the obligations of the parishes, became the subject of political debate. Widespread resistance, however, prevented the adoption of such legislation until 1847.[18]

The parishes resorted to various revenue raising measures. One of these was a fee that resembled an early inheritance tax. It was limited to 1/8 of a percent of a probate estate's net value. Donations and legacies were encouraged. Fees of various types were collected. In many parishes such money was deposited in a poor relief fund, which then issued interest-bearing loans. It also happened that a donation of grain became the initial capital for a poor relief *magasin*. These were operated with a clear profit motive with the profits dedicated to poor relief.

The first mention of midwives is found in the Church Rule of Orders of 1571. At that point, however, they remained unregulated. The Church Law of 1686 specified that midwives were to be appointed by the pastor, the churchwarden and parish elders (*sexman)*. The first serious, nationwide regulation, however, was only introduced in 1777. To become a midwife it was now necessary to successfully complete a course offered by the regional authorities. Starting in 1819 no one lacking such training could be employed as a midwife. In 1840 the midwives became legally entitled to an employment contract specifying their salary and fees.[19] The parishes paid for the training and, since her fees generally were insufficient to live on, provided the midwife with a base salary. There does not seem to have been any opposition in principle to having a parish midwife, but there was always a reluctance to pay the cost.

Primary education was not a national priority. In this area few if any initiatives were taken by the Diet or the government before the second quarter of the 19th century. The Church, however, was very interested. The ability of each worshiper to read the Bible for himself was an important principle in the dominant Lutheran tradition. The clergy were responsible for subjecting their parishioners to annual catechismal examinations (*husförhör)*, including their ability to read the Bible. The pastor thus had an interest in the literacy of his flock. As chairman of the parish meeting, the pastor frequently used his position to advance the cause of reading, and sometimes also of writing. This might involve providing a salary for a permanent or ambulatory schoolteacher or financing the construction of a schoolhouse. The State provided resources for such activities only in a few rare cases. An exception that proves the rule was the Royal permission granted to several parishes in Dalecarlia to devote a portion of their Crown tithes to anti-witchcraft education.[20]

The demands on the resources of the parishes started to increase in the later part of the 18th century. Having very little regular income, their position became increasingly strained. This, in turn, resulted in increasing pressure on the parishioners for mandatory contributions, which they, not surprisingly, resisted. Any additional source of parish income must have been very welcome indeed, not least for the pastor. Approval of his various spending proposals was frequently contingent on finding the necessary resources. Thus, the ability of the various funds and *magasins* to generate interest income no doubt greatly increased their attractiveness.

Why Were There Regional Differences?

There were almost no *magasins* in Scania. This anomaly clearly requires an explanation. For centuries Scania had been part of the Danish heartland, with the Sound being more of a link than a barrier. The Archbishop of Denmark had his seat in the Scanian city of Lund. Sweden definitively conquered Scania in 1660, but the process of assimilation was complex, slow and painful. Even in the 18th century many Swedes considered Finland a more natural part of the Realm than Scania.

When Sweden annexed Scania, it left parts of the Danish tax system intact. During the Reformation the Danish Crown had also confiscated a part of the tithes. It, however, was satisfied with a 1/3 share, not the 2/3 taken in Sweden. The local Danish churches retained 1/3 of the tithes in addition to the 1/3 that, as in Sweden, went to the pastor. The once Danish churches thus had a much larger and dependable income than those in Sweden who, in place of their historical third, only received the very meagre "wine and building grain" payment. Moreover, the parish meetings traditionally played a somewhat different role in the two countries. According to the "Encyclopaedia of Scandinavian Medieval Cultural History"[21], the Danish parish meetings had a far more limited role to play than those in Sweden.

In his study of Swedish local self-government from 1686 to 1862, K J Johansson (1937) observed that the parish meeting played a much smaller role in Scania than in other parts of Sweden. Unlike other types of records from Scania, very few minutes of parish meetings have been preserved. The clear implication is either that such meetings were rare or else that they were not considered important enough to have their minutes saved. Johansson lists a number of factors that may have contributed to reducing the importance of parish meetings in Scania. One of these was that the prevalence there of *patronatsrätt,* conferring the right to select the pastor on the landlord, also made him responsible for the practical issues that otherwise would have been decided by the parish meetings. The financial position of the Scanian parishes also was helped by their continued right to the Church's traditional *hemman* and their rents. Moreover, unlike the situation in "old" Sweden, the pastors in Scania were themselves required to maintain the vicarage and its associated buildings. Other differences included the presence of special state church inspectors who audited the accounts, thereby freeing the parish members from having to do so. Finally, there was a long-standing Danish tradition of dealing with practical matters at village, rather than the parish, level.[22]

The parish assembly meetings were convened by the pastor, who also set the agenda. Following the Reformation, the principal problem of local churches in "old" Sweden was a lack of resources. Consequently, the pastors repeatedly had to convene meetings to seek parish approval of new measures to raise revenues. The poverty of the Church made the pastors in "old" Sweden dependent on their parishioners, thus increasing the latter's influence. By contrast, the greater wealth of the Church in Scania freed its pastors from the need to deal with parish meetings. The weak financial condition of the parishes in "old" Sweden thus fostered a tradition of representative parish meetings that assumed responsibility

for solving practical problems. This cultural tradition was helpful when it came to administering activities such as a parish *magasin*. The lack of such a parish meeting tradition, together with a less pressing need for revenues because of the regular tithe income, seem to explain the lesser motivation for the creation of *magasins* in Scania This experience thus lends strong support to hypothesis number 2.

There is, however, a fly in the ointment. While this analysis also fits the former Danish provinces of Blekinge, Halland and Bohuslän, it does not do so for the island province (and county) of Gotland. Gotland once again became Swedish territory in 1645, following three hundred years of Danish rule. During those centuries, the island had been fully incorporated into the Danish Kingdom and, even more important, into the Danish Church. Why then was the share of parishes on Gotland having *magasins* greater than that of any other county, including all of "old" Sweden? The answer lies in the one striking difference between Gotland and the other former Danish counties. While the tithe in the latter as equally shared by the Crown, the local parish and the pastor, on Gotland all of it went to the pastor. The likely explanation for this is that the island's parishes were so small that it took the entire tithe to provide the pastor with a decent living. Of course, it also meant that these parishes, unlike those in the rest of the formerly Danish territory, received no tithe payments at all. Thus, their financial situation was even worse than that of those in "old" Sweden. There the parishes at least received the, admittedly meagre, "wine and building grain". Given this lack of revenue, it is hardly surprising that the *magasins* were especially active there. This observation also tends to support the hypothesis concerning local motivating forces.

Over time, the parish meeting became the nucleus of Sweden's comparatively well-developed system of local self-government. It is important, however, not to read history backwards. The meetings of the 18th and 19th centuries were not intended to be expressions of self-government. Rather they were perceived as a means by which the pastor could obtain agreement to compulsory contribution or have other decisions confirmed. In parishes with limited wealth and little income, meetings were more frequent than where revenues were more ample. The parish assembly's role in advancing representative government was based not on abundance but on financial stress.

Demand for Loans

The need for additional revenues in the parishes was important incentive to develop a stable interest income from institutions that supplied a stable interest income. Supply, however, had to be accompanied by demand. The hypothesis presented here is that the structure and the imperfections of the grain market created a demand for loans. In what follows, the impact of general conditions in the grain market on the demand for loans will be analyzed. It is assumed that the varying demand for *magasin* loans among regions was the result of market differences and particularly its imperfections and that variations over time were the result of developments in production, prices and closer integration.

Imperfect Markets

The rates of growth of *magasins* reported in the previous two chapters varied during different stages of development. It is only natural that the *magasins* initially grew rapidly. Starting with limited capital, but being able to charge high interest rates, they had both the desire and the means to expand. After they had reached a certain size, however, using the interest income for dividend payments, or to support parish activities, became increasingly attractive. In addition, further growth was probably constrained by limited demand for loans. The "median" *magasin* displayed in figure 6.2 experienced long-term growth until 1835. This accords well with qualitative evidence that points to a peak in the 1830s. The growth up to that point was quite smooth, with only a few breaks. It seems to have been particularly rapid during the first decade of the 19th century then following a downturn in the early 1820s. The first of these periods was characterized by strong price increases and the second by falling prices. To us it might seem irrational to borrow grain during periods of rising prices. That conclusion, however, is based on the modern assumption that price increases are irreversible. If commodity prices are thought of as fluctuating (going both up and down), borrowing in kind when prices rise and repaying in kind when they fall makes perfect sense and these observations lend some credence to the hypothesis that loan volume was demand sensitive.

This discussion has stressed the role of the functioning of the grain market. Previously in this chapter the problems of the small peasant turning to the market were addressed. There are a number of contemporary accounts supporting this proposition, a very few of which will be quoted. While describing his travels to Gotland in 1740, Linnaeus related the following observations: "The credit based trade that the burghers pursued with the peasants was described to us by a local merchant. That is, how the burghers advanced credit to the peasant during the year, providing him with goods and giving him food and drink when he came to town, lending him money to pay his taxes, seldom settling his accounts and often advancing more than can be repaid. The peasant's obligation in return is to turn everything he brings to town over to his burgher to be credited against his account. No settling of the account is done because, after a few years of such trade, the burgher would ruin the peasant if he were to close the account. The peasant does not haggle concerning his wares, but the merchant sets the prices of the goods himself. Should the peasant dare to go to another merchant, his account would soon be closed."[23]

While visiting Vaksala in 1772, the traveller Barchaeus noted in his travel diary that he had encountered a man who had bought grain on credit from a retailer in nearby Uppsala. The man had been charged 28 *daler smt* to be paid in cash in the fall. The price was then expected to have fallen to 12 *daler* meaning that the man had to repay more than twice the grain he had received. "Oh poor wretched worker" concluded Barchaeus.[24]

At the Parliamentary session of 1828, a certain Mr Rothlieb presented a proposal for low interest loans to be provided to "country men" so that they could store grain at home. The intention was that they would be able to refrain from selling at low prices, even at times when they needed cash to pay their monetary taxes,

particularly in locations far from the coast and the major cities.[25] The proposal was not adopted, but it indicated a general awareness of the problem.

The interest rate of the *magasins* is discussed by the Academy of Agriculture in their report to the Government in 1834. They first noted that "an interest of 4 *kappar* for a barrel borrowed during some months by an ordinary calculation with numbers gives a rather unfavourable result for the borrower". But "taking into account that one barrel of grain in the spring when needed after a poor harvest can not be bought for less than e.g. 8 *rdr bko*" and that the peasant after harvesting will perhaps not receive more than 5 *rdr* for the same quantity, "then one can then see the advantage for him to repay his debt with grain in kind." In such a case the 4 *kappar* in interest are of small importance." [26]

These statements in combination with a general lack of information of various local market opportunities and the restriction on competition that Linnaeus referred to indicate the imperfections of the retail market and conveys an important aspect of the peasant's market situation, where he was at a profound disadvantage. Of course, this phenomenon was not confined to Sweden. One of the principal motivations behind the Italian *Monti Frumentari* was to eliminate the "*contratti alla voce*" which placed the peasants in the same dependent position when urban markets were distant.

Such imperfections of the market can be illustrated with some stylized-fact calculations that will provide reasons to use the in kind loans the *magasins* offered. The failures of the market can be represented as transactions costs (TC). Consider the situation of a peasant who in April needs additional grain for seed or bread and faces two options.

1) He can borrow grain from a *magasin* and repay the loan with 12.5% interest in December, or

2) He can buy on credit from an urban retailer and repay this loan with money raised by selling grain to the retailer in December. This alternative requires the peasant to sell sufficient grain to cover his debt for what he bought, plus interest since the spring (8 months at 6% per annum = 4%).

His transaction will doubtlessly involve losses from both buying and selling in a rather monopolistic market and with asymmetric information. For this second alternative, market conditions are crucial. In the spring the market was usually very thin. In addition, the peasant's position was weakened by a lack of competition and his dependence on a single trader, a consequence of his lack of liquidity. In December, when threshing was complete, all peasants needed cash to pay their monetary taxes. The inevitable result was a glut on the market. Given these conditions, plus the peasant's lack of information concerning alternative buyers and the need to clear his debts, it seems certain that he received a lower selling price, and paid a higher purchase price, than would have been the case with a perfect market. These losses are here classified as transaction costs, TC.

Three different assumptions, all of them conservative, are made concerning the size of the TC. These are a) 10%, b) 5% and c) 3% for each transaction, spring or fall. It is also assumed that the grain price in the spring, when borrowing occurs, is the same as in the previous fall. As for the expected price next fall, when the loan has to

be repaid, it is always assumed to equal the long-term average price of 100. Consider the following example: In a particular year the price of grain is 10 per cent above the long-term average i.e. 110. In the spring when the peasant buys seed, he will thus pay a price of 110 plus the TC of 5% (assumption b), equalling a total price of 115.5. He will then be charged 4% for the eight month duration of the loan (6% per annum). At the time of repayment his debt will have risen to 120.2. Furthermore, when he in the fall sells grain to raise money to pay off the loan, he will receive a price of 100 (the long-term average) minus the TC of 5%, equalling a net price of 95. He will thus have to sell a quantity of grain equal to 1.26 (120.2 / 95) times the amount he purchased. By comparison, a *magasin* loan at 12.5% is attractive.

A variety of such assumptions have been used to calculate stylized-fact results. These are summarized in figure 8.5. It clearly demonstrates that regardless of the size of the TC, when the price level at the time of borrowing was above average, it was always more advantageous to borrow from a *magasin*. Only if both the price at the time of borrowing and the TC were very low would the *magasin* loan be more expensive. No regular seasonal variations have been included here but doing so would further reinforce the results. A further advantage of the *magasin* loans, not included in these examples, was the possibility that they could be extended, particularly in years with shortage of grain. Thus, if the loan became due when grain prices were high, the peasant could delay the payment a year, or even longer, until the opportunity cost of repayment was lower.

The inevitable conclusion is that as long as the imperfections of the grain market and high transactions costs prevailed, *magasin* borrowing was an attractive alternative for peasants in need of grain.

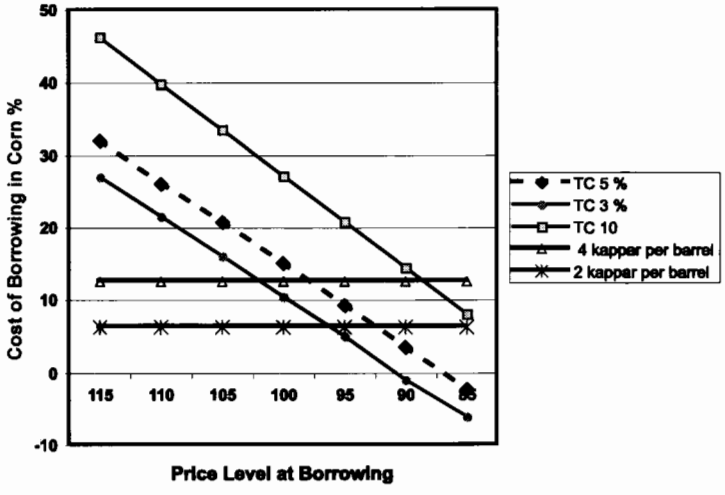


Figure 8.5
Borrowing Costs Measured in Grain: Stylized Facts.

Interest Rates

The Academy of Agriculture's survey of the parish *magasins* of 1832 provides data on the interest rates they charged on loans. Two rates predominate: 4 *kappar* and 2 *kappar* per barrel i.e. 6.25% and 12.5% respectively [27]. Plotting these rates on a map reveals a clear geographical pattern. The low interest region consists primarily of Västmanland, Dalecarlia and Gävleborg Counties, plus a portion of Örebro County. All of these areas are located either in or close to *Bergslagen.* As discussed above, that was the region where the peasants had a comparatively stable and competitive market for their excess grain. Thus, they no doubt incurred lower transactions there than in other parts of the Country. Having access to a well functioning market also reduced the peasant's need to borrow grain from the *magasins*, who therefore were in a weaker competitive position to charge high interest rates if they wished to attract customers. The example of Säby in Västmanland close to Bergslagen in chapter 7 shows how the rate of interest was lowered in response to a weaker demand for loans.

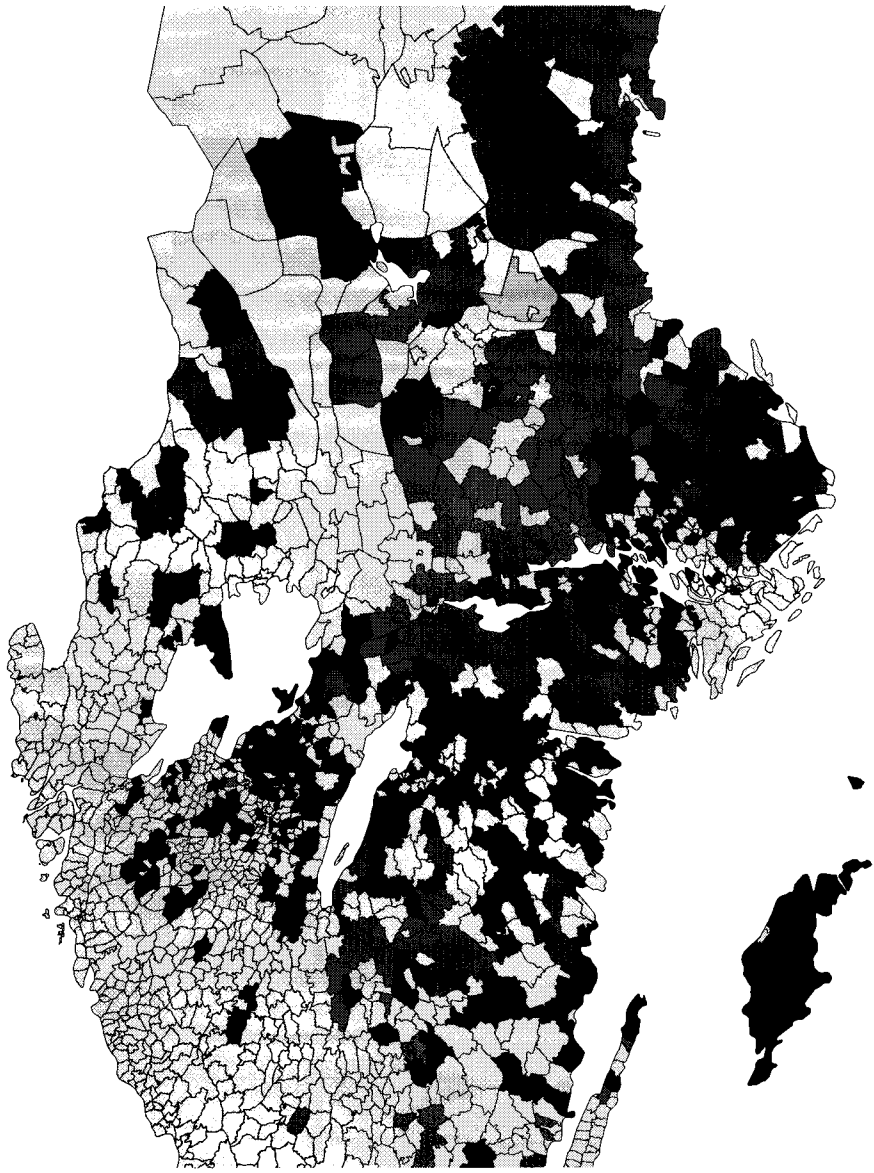
In a few areas, such as the south western parts of Södermanland and the South Wedbo *härad* in Jönköping County, however, this explanation might not hold. Some of the low interest rate parishes in Södermanland had *magasins* closely associated with large estates. In these cases, the profits to be used for parish expenses might not have been given equal priority.

Similar data from 1842 indicates that few parishes had changed their interest rates. It was not unusual, however, for the *magasins* to temporarily drop their rates in particular years for quantities that still in June were retained because of weak demand for loans. They certainly did not want grain left in their storehouse over the summer where it required regular tossing and was exposed to risk of loss. There were even cases when the shareowners of a *magasin* for this reason were obliged to borrow in order to avoid losses but then at a low rate.

The rather sharp dividing line between Uppsala and Västmanland counties as regards the rate of interest is a challenge to explain. There was also another difference, the magasins in Uppsala county had generally greater assets per inhabitant. The conditions for agricultural production were rather similar in the two counties. The natural explanation would be that the size of the *magasins* was to a large extent dependent on the demand for loans and in many cases the decisions to reduce the rate were made in order to promote the demand for loans. The combination of high assets per capita and high interest rates would then indicate a stronger demand for in kind loans in Uppsala than in Västmanland county, which may be explained by the more favourable conditions for finding outlets for grain in the latter county. This was high-lighted by the 1822 reports from the county governors in Västmanland and Uppsala Counties quoted earlier in this chapter, where they described the outlet conditions in the two counties quite differently. This interpretation is further supported by the observation that when the peasants in the 1820s got better opportunities to have their grain payments to the Crown converted to money this was very quickly taken advantage of in Västmanland County while many peasants in Uppsala county still in the 1830s and 1840s, at least in good harvest years, still preferred to pay in kind. (See next section)

The literature on the long-run evolution of interest rates demonstrates that there is a negative relationship between the efficiency of the credit market and interest rates. The better the credit market functions, the lower the rate of interest. It is hardly possible, however, to evaluate the relative efficiency of regional credit markets in this period in Sweden. The widespread establishment of regional banks or savings institutions still lay in the future. In the almost total absence of regional credit granting institutions, an informal credit market, based on promissory notes, was dominant.[28] The differences in interest rate seems more to be a reflection of the performance of the markets for grain than that for monetary credits.

The grain market in the 18th century may have performed fairly well from a macro perspective as regards protecting against too high price increases in the cities or in the Bergslagen in years of scarcity, but when the small peasants got surpluses for sale the markets performed less satisfactory. Competitive transactions were hampered by a general lack of liquidity, which limited the circle of potential transaction partners to those where there was trust enough to make credit relations. There were various ways in which the peasants could protect themselves against these imperfections like other activities that gave monetary income and the produce of distilled acua vit from the grain. The use of in-kind borrowing in the parish *magasins* was another. In this way the demand for *magasin* loans reflected he imperfections of the market.



Map 8.1
Rates of Interest in 1832. *Kappar* per Barrel.

Legend:

4 *Kappar* 2 *Kappar*

The Impact of Changing Condition on the *Magasins*

Having argued that the parish *magasin* institution depended on a specific set of social and economic circumstances, it is natural to be curious about the impact of changes in those conditions. What were the consequences on the further evolution of the *magasin*?

Market Changes

Long-Term Trends in Grain Production

There seems to be general agreement among students of agricultural development during the 18th century that severe decreases in output occurred in the 1690s and the first two decades of the 18th century. The blame falls on the "little ice age", individual year crop failures and wartime dislocations. There was recovery during the 1720s, but the ensuing rate of growth was feeble compared to the expansion of the population. The rate of increase in total agricultural production accelerated towards the end of the century, and there was probably some gain in per capita output during the 1790s. The demographic data provided by the Statistical Office (*Tabellverket)* is reliable, but in the absence of reliable sources the estimates of agricultural production that Gadd (2000) could provide were more of a kind of educated guesses.

Table 8.9
Growth of Population and Output of Grain.

	Annual average increase, per cent		
	Population	Grain production	Per capita production
1720-1750	0.7	0.9	0.2
1751-1780	0.5	0.1	-0.4
1780-1800	0.5	0.5	0
1800-1825	0.7	2.2	1.5
1825-1850	1.0	0.3	-0.7

Sources SCB (1955); Estimates from a chart in Gadd (2000) p.348.

Increasing grain imports and decreasing real wages (daily wage rate/price of rye) over the course of the 18th century implies that population was increasing faster than grain production until the 1780s. During the ensuing period, however, the growth of output accelerated considerably. It appears that both the high international prices resulting from the Napoleonic Wars, and the enclosure movement in Scania (*enskifte),* contributed to the more rapid increase in output. Furthermore, this acceleration was not limited to grain. It also included potatoes, which now emerged as an important substitute for grain. They were both a cheap source of calories and a suitable raw material for the production of *aqua vit.* These developments contributed to the gradual reduction in the need for imports,

which, by 1820, had left Sweden largely self-sufficient in grains.

The increase in grain production was relatively greater in the deficit areas, such as *Bergslagen* and the southern Swedish highlands, than on the plains of eastern Sweden. Local deficits continued to exist, but at a lower level. At the same time as domestic balance was achieved, a prohibitive tariff on grain imports was imposed. The initial consequence of this was a reduced need for geographical reallocation of grain. But new factors entered the stage and drew the emergence of a domestic trade. Urban growth in Sweden was rather slow during the 18th century, but it accelerated thereafter. The population of the cities doubled between 1810 and 1860, resulting in rapid growth in the market demand for grain. As a result, the increasing surplus being produced in Scania was increasingly traded with other parts of the Country, especially with Gothenburg, Stockholm and the coastal cities north of the Capital. The inevitable result was an expanding grain trade, closer market integration and an emerging network of specialized merchants.

There are numerous indications of changes that made the market more efficient during the course of the 19th century. Increasing exports, improved transportation, better dissemination of information and improved liquidity all contributed to this outcome. Since it has been argued here that the imperfections of the grain market was an important reason for the demand for loans, the need to borrow grain can be assumed to have decreased.

Exports

Following 170 years of almost continuous net imports of grain, in 1820 Sweden entered a 25-year period of balanced self-sufficiency. Eventually, starting in the late 1840s, a growing export surplus of grain appeared. These exports consisted mainly of oats, most of them grown in Western Sweden, with some additional supplies originating in the south, and even in the east, of the country. The merchant firms were active both in the export and the import trade, and both at the wholesale and the retail level. For them the exportation of oats was initially a "sideline". At least in Scania the domestic grain trade was considerably more important. Over time, however, specialized oat-exporting firms developed. That degree of specialization required the establishment of a widespread oat purchasing network that bought, collected, stored and shipped the product. The specialized merchants organized their trade around a number of coastal shipping points. They then dispatched agents to procure the grain from the peasants. Competition among the merchants and their agents created a more stable and advantageous market for the farmers. These developments occurred primarily along the western coast, but they also spread to the south and even the east. In the latter region the Öhman firm shipped through Norrtälje, Oxelösund, Norrköping and Valdemarsvik.[29] While much of this system was in place well before the railways, their coming increased its efficiency.

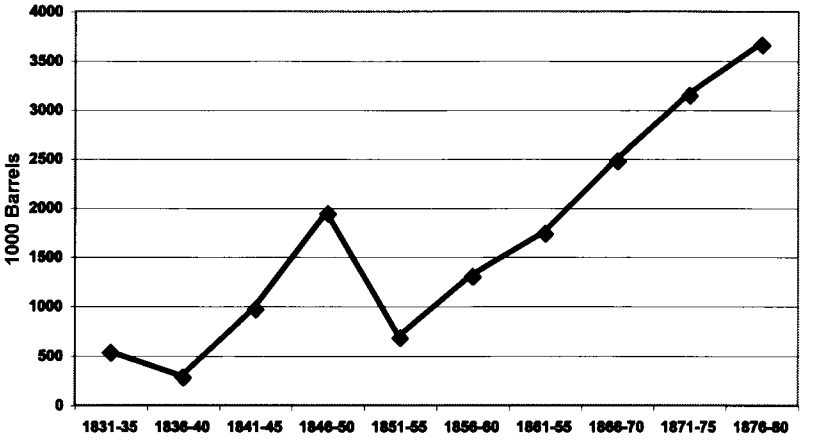


Figure 8.6
Swedish Grain Exports
Source: Fridlizius (1957).

Transportation Facilities

The role of high transport costs in impeding market integration has been outlined above. During the course of the 19th century the conditions for transport changed fundamentally. The building of canals that, although relatively short, were strategically located also contributed to lower transport costs. The Trollhätte and Södertälje Canals made Lakes Väner and Mälar, respectively, directly accessible to sea going vessels around 1820. The completion of the Göta Canal further improved the situation by linking the western part of Östergötland with both the Baltic Sea and Lake Väner. In the 1830s port facilities in a number of cities were built or expanded to efficiently load and unload the larger ships that now entered the trade. Even before the middle of the century, numerous such investments had been made all along the Baltic coast and in south western Sweden. In addition, a number of cities located on the shores of the large Swedish lakes that had suddenly been linked to the sea were provided with port facilities. These improvements naturally made a substantial contribution to the further integration of the domestic grain market.

The level of freight rates was decisive for the extent of market integration between Scania and the island of Öland with ports such as Gothenburg and Stockholm. According to Krantz (1986), there was a sharp drop in the cost of domestic sea transport between the 1830s and 1850s, followed by a slow, but steady, decline over the rest of the century. Thourburn's calculations also indicate a drop in water transport costs, but his decline does not begin until roughly 1850.

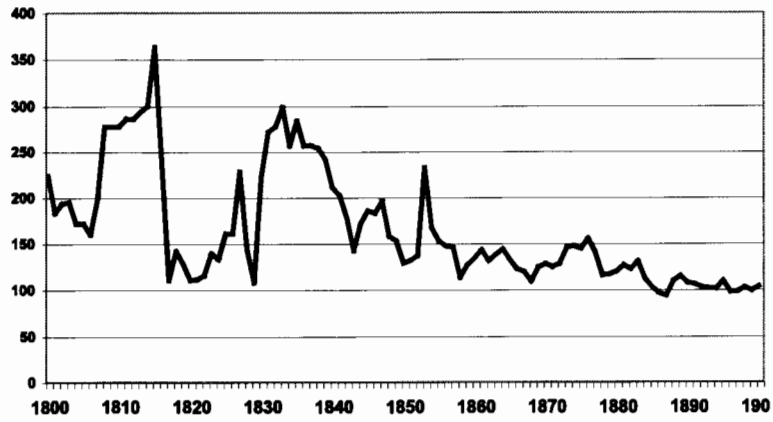


Figure 8.7
Domestic Nautical Freight Rates, 1800-1900 Index 1893=100
Source: Krantz(1986).

The costs for land transport of grain to the port cities were even more important. The construction of railroads began in the late 1850s. By the 1870s the coverage of the railway network was becoming increasingly dense. As early as 1858, however, a speaker at the Eigth General Agricultural Meeting argued that profit margins in the grain trade had declined as a result of improved communications, thanks to the telegraph, and cheaper transport, thanks to the steamship and railroad. He was not alone. Virtually every speaker referred to the impact of the railways.[30] The railways were particularly important for short and medium sized transports where they represented a huge improvement in costs and capacity compared with horse and carriage

Table 8.10
The Swedish Railway Network (1000 kms)

Railway net, km	
1856	66
1860	567
1865	1305
1870	2579
1875	3679
1880	5389

Source: Svensk Uppslagsbok Vol 14 (1937) p.852

According to Thourburn (2000) who calculated various kinds of transport costs, the costs for land transport were more important than those for water. The truly important drop in transport costs came with the railroads. While the costs of road transport utilizing horses and carriage increased strongly after the mid century, the railways then came and provided much lower costs per km. Based on

Thourburn's data one can calculate an example where the costs to e.g. transport 1 ton of rye 500 km, first by land transport 100 km and then 400 km by water transport, decreased substantially.

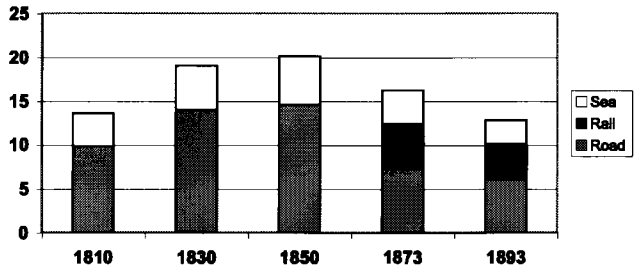


Figure 8.8
Cost (in SEK) of Transporting One Ton of Rye. An Example.
Note: Example with 400 km water transport and 100 km land transport. In 1810–1850 land transport by horse and carriage; in 1873 and 1893: land transport 25 km by horse and carriage and 75 km by railway. Calculations based on data from Thorburn (2000) p. 152

Information

The new technology did not only bring less costly transportation of goods but the development of a system of rapid and reliable communications had a revolutionary effect on the dissemination of information. During the 1830s coastal steamship lines were established and the major lakes were connected by canals. These provided much faster and regular communications than had been possible with horse drawn carriages. When the telegraph became available in the 1850s, the speed of communications increased further. Some decades later, when the railway system became widespread, the number of travellers who spread information increased dramatically. Probably even more important, however, was the distribution of urban newspapers into the countryside. These provided relatively current news about the world and the markets. This increase in both the volume and the currency of information undoubtedly improved the efficiency of the grain markets, dependent as they were both on information of ever changing local supply conditions and world wide developments. In particular, the peasants must have benefited from their greater access to market information since they had always been the ones who were deprived of it. Lack of information is always a serious obstacle to market efficiency.

Liquidity

During the late 18th and early 19th centuries liquidity was an ever-present problem. People seldom had cash or monetary assets subject to quick withdrawal. It was not until the second half of the 19th century that bank accounts became widespread. A general survey of the development of the credit market and the monetization of the economy can be found in Lindgren (2002).

Having access to liquid means of payment was a great advantage for a farmer. For example, in case he needed to buy seed he was no longer limited to buying

on credit from a merchant who monopolized his business. The availability of liquidity could liberate the grain trade and eliminate a lot of the market imperfections. After 1850 the probate records from both Balingsta and Atlingbo reflect an increase in the, admittedly still limited, frequency of cash assets. In his study of probate records from Vånga in Scania, Perlinge (2005) presents more precise results confirming that trend.

Table 8.11
Estimated Liquid Assets per Inhabitant in Vånga 1840-1899. SEK.

	Bank notes	Other liquid assets mainly in bank accounts	Total liquid Assets
1840-9	4.56	0	4.56
1850-9	4.57	3.33	7.90
1860-9	2.80	19.36	22.16
1870-9	6.68	26.23	32.91
1880-9	14.86	48.44	63.30
1890-9	14.61	160.95	175.56

Source: Calculations based on Perlinge (2005), Table 9, p. 248.

These observations are in good accord with the macro economic calculations concerning the supply of money and easily accessible bank assets (M2) performed by Ögren (2003). These indicate explosive growth, especially after 1870. Figure 8.9

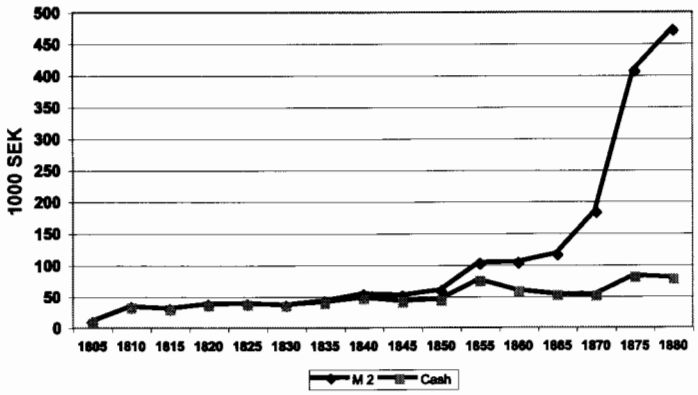


Figure 8.9
Growth of Liquid Assets (Cash and M2).
Source: Ögren (2003) p. 288-89.

Access to liquidity must have provided the farmers with greater freedom to seek more advantageous transactions. One indication of this was a growing interest from the peasants to convert the grain nominated payments to the Crown into money. Since the 17th century it had been possible for them to do so by mutual

agreement with the recipient. In years when the crops had failed the peasants had always preferred to pay their taxes in cash. They simply lacked the grain necessary, and it was disadvantageous to buy grain to pay in kind taxes. Conversely, in surplus years it was better to pay the taxes in kind, at least in the absence of attractive outlets for the extra grain. The shift towards monetary taxes varied over time and place. During the 18th century the Crown was often eager to receive payment in kind. By the late 1790s, however, the peasants whose taxes went to Uppsala University had to a considerable extent converted to cash payments (Lindgren 1971). One possible explanation is that the University in any case was going to dispose of the grain, and it was quite happy to be relieved of the cost and trouble of selling it, at least as long as the conversion price was no lower than that available in the market.

The system of in kind tax payments was, at least formally, retained until 1869. During the 1820s it had, however, become increasingly common for taxes to be commuted into cash according to market scale prices. At the Parliamentary session of 1828–30 the decision was taken to permit the peasants to choose between paying their grain denominated taxes in kind or in money, i.e. the Crown could no longer insist on grain payments.

The details of this tax commutation process could shed light on the relationship of the peasants to the market. Unfortunately, however, such knowledge is hard to come by. A Royal Commission that investigated payment practices during the ten-year period 1835–44 concluded that only about 10% of the taxes denominated in grain were actually paid in grain. In most counties, an overwhelming share of the taxes was paid in money. Only in four counties, Stockholm, Uppsala, Östergötland and Kalmar, did in kind payments constitute a significant share. In 1841 the extremely poor crops in Stockholm and Uppsala Counties resulted in only 3% of the taxes being paid in kind. By contrast, following the good harvests of 1835 and 1836, the share of grain was 40%. Correlating the harvest index with this payment percentage over the ten-year period results in coefficients of $r = 0.51$ and $r = 0.47$ respectively for the two counties.[31] These results indicate that from the 1820s there were many counties where the market worked sufficiently well to make monetary payments preferable. In a few other counties, however, good harvests still yielded surpluses that could not be sold for higher prices than those specified by the market scales.

The expansion of the grain trade was a consequence of increased production. At the same time, however, the increase in trade provided an incentive for more output. A continuous market demand, even for small quantities, provided the peasants with greater certainty of finding an outlet for their surplus grain. That, in turn, made it worth their while to invest labour and money in land reclamation, drainage ditches and other improvements. Merchants, who bought grain for export or for resale to the major breweries and the new steam-powered flourmills, provided the peasants with new opportunities. As their production shifted from self-sufficiency to marketable crops, the peasants themselves were transformed into farmers. It seems natural that this development also had an impact on the demand for loans in grain.

All information indicate that the conditions for a better performing grain market were improving starting around the first quarter of the 19th century. The process was obviously closely linked with developments in other parts of the society, like urbanisation, growing liquidity and improvement of transport infrastructure. Some of the factors that were influential have been discussed here but there were certainly many others. Their relative mix did certainly change both as regards to time and location and it provides an explanation why the demand for in kind loans of grain also started to decline.

New Local Government Legislation Alters the Institutional Framework

In 1862 new legislation regulating the functioning of Swedish local government was enacted. The old system, with all responsibility resting on the parishes, was replaced by a dual structure. The parishes remained in charge of strictly church related matters, such as the maintenance and administration of church property and personnel. Other local government activities, such as primary education, poor relief and health care, however, were transferred to the newly created communes. An important feature of the reforms was that the communes were empowered to finance their programs by imposing taxes on the local residents.[32] Special legislation of that same year defined the base and administrative rules for this communal tax. It was based on the concept of a *fyrk,* which was defined in terms of property values and income. Throughout the 1860s and 1870s substantial increases in the communal taxes were imposed in order to meet growing local needs.

Financial responsibility and voting rights in the communes ceased being allocated according to the *mantal* system. Decision making was removed from the pastor-chaired parish meeting and entrusted to a newly created communal assembly (*kommunalstämma).*

The *magasins*, which were under the ultimate jurisdiction of the parish meeting, did not fit comfortably into this new institutional structure. Moreover, the financial needs of the parish no longer required the income of a *magasin.* The institutional disharmony was greater in some parishes than in others. In those that were strictly agricultural and consisted only of freeholders, the new system of local government made less difference. Thus it is not surprising that the parish *magasin* in Atlingbo continued to be active longer than those in most other parishes. By contrast, the Balingsta *magasin* seems to have disappeared as early as the 1870s.

The institutional circumstances and conditions that once were a motive for the parishes to utilize the *magasin* system gradually changed or disappeared. That the level of activity in the magasins declined in the same period fits well with the hypotheses used here.

Footnotes

[1] Åmark (1915) p. 20–24.
[2] Quoted in Åmark (1915) p. 20.
[3] Calculations by Thorburn (2000) p. 307 indicate that in 1780 49% of the Swedish population lived within ten kilometres off the coast. By 1850 that number had risen to 55%, as a result of the country's two largest lakes, the Väner and the Vätter, by then having been linked to the sea.
[4] Gullstrand (1923) p. 26.
[5] These were payments made in lieu of the obligation to support a locally based regiment.
[6] Olsson (2006) has made estimates for Scandia indicating that the burden of supporting a soldier during the period 1810–40 amounted to between 2.5 and 4.5 barrels of rye per *mantal*. It is unclear if these results can be applied to the rest of Sweden.
[7] Åmark (1915). p. 303.
[8] Utterström (1957) p. 213.
[9] KK F IV: 9.
[10] CG in Västmanlands län femårsberättelse 1822 and 1844.
[11] CG in Uppsala län, femårsberättelse 1822
[12] Bergström (1992).
[13] Lansräkenskaperna, Verifikationer, Västmanland 1750. RA.
[14] Frohnert (1993), p. 43.
[15] Frohnert (1993), p. 40.
[16] Lindgren (1971) p. 49.
[17] At Stora Malm, even the crofters were required to pay into the initial capital of the *magasin* even though they were not permitted to participate in the parish assembly, thus emphasizing the non-voluntary aspect of their contribution.
[18] Skoglund (1992).
[19] Höjeberg (1981).
[20] Klose (1992).
[21] KLNM. Vol 16 p. 371–74.
[22] Johansson (1937) p. 230–37.
[23] von Linné (1985) p. 79.
[24] Quoted in Utterström (1957a).
[25] RH 1828–30. Adelns prot. V. p. 249
[26] Bil. prot. för handels- och finansärenden 15/10 1834. RA
[27] 63% of all *magasins* reported 4 *kappar* and 28% 2 *kappar*. Parish list.
[28] Lindgren (2002).
[29] Fridlizius (1957).
[30] Åttonde Allmänna Svenska Lantbruksmötet 1858, p. 73–80 .
[31] Taxpayments: RH 1847–48, 1 Saml.1 Avd.2 Band.; Harvests: Hellstenius (1871).
[32] In principle, such power to impose taxes had been included in the Parish Assembly Order of 1814. Since it specified neither a tax base nor an assessment system, however, it remained largely a dead letter. It was extended without further clarification in the Church Law of 1841.

CHAPTER IX

Conclusion

Following a century of almost continuous warfare, Sweden entered a new era starting in 1720. It was not, however, to be a time of tranquility. In Sweden, like in the rest of Europe, every aspect of life was beset by volatility. This uncertainty especially affected the supply of grain. For the individual peasant, variable weather caused harvest outcomes to swing dramatically. That such fluctuations would occur was taken for granted as expressions of either the benevolence or the wrath of Almighty God.

Measures could be taken to somewhat mitigate the effects of such volatility. The individual peasant could adopt what is now called risk adverse behavior. This meant sometimes foregoing an attempt to maximize the expected size of his crop in favor of maximizing his chances of survival. Such behavior lies at the heart of the now famous discussion concerning the peasantry's reluctance to enclose their fields. In some cases, and to a certain extent, this may have been the motive for resisting enclosures. But other, more effective strategies to reduce the consequences of crop failure were available. One of these was the common practice of dividing cultivation between winter and spring grains. Since the two crops had different growth patterns, the weather in a particular year could be expected to affect their yields differently. This, in turn, would tend to reduce the variability in each year's total crop. In addition, there were other money-generating activities available. These could provide cash for the purchase of grain in poor crop years, although, in the view of many critics, at the expense of hampering agricultural development.

Volatility, however, remained a major problem both for the individual and for society at large. For the individual peasant a harvest coefficient of variation of 30–40 could be normal. That implies that every six year his crop could give only 2/3 or less of the average yield. Clearly, for anyone living on the edge of hunger, such variability must have been a serious concern.

Studying harvest variations and their effect on prices quickly reveals the importance of market integration. The harvest variation experienced by individual peasants far exceeded that of an entire region. While the harvests of various farms in the same village, and various villages in the same parish, were correlated, that correlation was far from perfect. Differences in the microclimate, as well as in soil conditions and exposure to wind and rain, assured that not every farm would have the same experience. Thus, at least to some extent, individual harvest variations were offsetting, thereby reducing the size of the aggregate fluctuations.

As the area involved increased, the correlation and the overall variability decreased. This effect could reduce the coefficient of variation from more than 30 at the farm level to 15 or less at a national level. [1]

Price theory indicates that even a small shift in the supply curve, if combined with an inelastic demand curve such as that for grain, will have a major effect on price. The magnitude of such supply curve shifts depended on the nature of supply, that is the source of the grain. The larger the integrated production area, the smaller the shifts. Thus, more integrated production resulted in less supply volatility, thereby reducing price variability.

The most efficient way for integration to reduce price volatility, however, was unquestionably to enter the world market. In fact, imports did not have to be particularly large to have an impact of prices. As theory indicates, price is determined not by the cost of average, but of marginal, supply, and marginal supply consisted precisely of imports. Thus, even a limited volume of imports could have a crucial impact on prices.[2]

Sweden suffered from a grain deficit that frequently required imports from the mid 17th until the early 19th century. Local grain prices thus came to depend on international prices. It also meant that Stockholm prices became less volatile than if they had depended entirely on domestic production. Indeed, they were somewhat steadier than those in many other European cities. Integration into the world market provided a degree of protection against the price spikes associated with domestic crop failure. Aside from a few years, such as 1771, when all of Northern Europe suffered a crisis of supply, grain was available at the world market price plus a margin for transaction costs. Problems, however, remained. As Amarthya Sen has noted, the worst aspect of a hunger crisis was not an absolute shortage of grain, but the inability of much of the population to purchase, or otherwise obtain, the necessities of life.

Harvest volatility, of course, also means that some years were very good. Inelastic demand, however, created a problem in disposing of the peasants' surplus grain, especially since no adequate trade organization existed to ship it to other regions. While this problem was not as acute as a hunger crisis, in the long run it could be quite serious. It meant that the peasants had no incentive to increase production to the point where the sale of grain would become a regular and reliable source of income. The Swedish system, combining feudal rents with the allotment system (*indelningsverket)* of tax and tithe payments in kind, channeled surplus grain onto the market, but without the direct participation of the peasants who produced it. Any additional supplies were restricted to local outlets, of which the distillation of *brännvin* was especially cherished by the peasants. This national intoxicant had high value added and was easy to store, transport and sell. Surplus years could also bring problems for the recipients of allotted taxes and tithes. Low grain prices reduced their money income from the sale of the grain they received. This group included much of both the Nobility and the Clergy.

The reliance on storage to mitigate the effects of harvest volatility goes back to Biblical times. Theory indicates that very substantial amounts of grain must be available from storehouses and added to supply if price increases are to be curbed.

Theoretical models indicate that imports were a much more efficient way to combat high prices. Moreover, once imports were available, stored supplies offered little in the way of further price reduction. Empirical evidence also indicates that harvest-to-harvest storage seldom was commercially viable. Even when the stored grain was produced during years with very low prices, the gains were unlikely to cover storage costs. In fact, storage was very expensive, especially in a country like Sweden where the late summer and early fall was usually wet, leaving the grain too damp for efficient storage. In addition, there were the costs of handling, as well as losses from vermin and dirt, not to mention the opportunity cost of capital. Thus, it is hardly surprising that little commercial storage took place.

There was, however, another aspect to grain storage. The purchase of grain by storehouses could help maintain prices in a glut, at least locally. Producers and other suppliers would be provided an outlet for grain that otherwise would have remained unsold. In the absence of any organized collection of grain for export, world market integration offered no relief in such a situation. The only possibilities were increased domestic integration or storage.

During the Age of Liberty (1719–1772), in Sweden, as in much of the rest of Europe, there was a growing political interest in policies intended to influence the market for grain. Public storage was seen as an important stabilizing measure. Since storage was not commercially viable, it had to be justified by considerations other than profit. In Prussia, the very prototype of the strong State, a centralized system of Kriegesmagazine (military storehouses) had been created to serve the army. It also, however, acted to stabilize the grain market through its purchases and sales. Whether Sweden was inspired by Prussia or other foreign prototypes is difficult to say since there is a total absence of references to foreign examples. Various proposals that the Crown should establish a storage system were, however, resisted by the Administrative Boards[3]. They argued that the Crown lacked sufficient resources and instead advocated a system of parish *magasins* that would place no demands on the central government. The latter suggestion, however, was resisted by the Peasant Estate of the Parliament. They saw it as an attempt by the Crown to free itself of responsibility for public relief. Moreover, there was a widespread suspicion that the Government would use such a system to require contributions or otherwise violate the peasants' property rights. These concerns help explain why the proposal for parish *magasins* made so little progress from one Parliamentary session to the next during the lengthy period 1723–1749.

Apparently few actors were prepared to impose *magasins* on the parishes. Furthermore, it is not clear that the State would have been able to enforce such a decision. In order to reduce opposition, it was repeatedly emphasized that the establishment of *magasins* was voluntary, that each parish was entitled to create its own charter and regulations, that public officials would be excluded from management and that the *magasin* assets would be exempt from seizure for public or private debts. A number of countries whose governments can be characterized as weak promoted the creation of local storage systems ones based on public, charitable or religious initiatives instead of central government solutions. Such was the case with Spain, Italy, Russia, Norway and even China.

Following decades of frustrated efforts to establish *magasins*, success was suddenly achieved in 1750. That year witnessed bumper crops, low prices and very likely a lack of market outlets for the peasantry's surplus grain. These conditions made it less difficult than usual to persuade the normally reluctant and suspicious peasants to contribute to the initial capital fund of a *magasin*. The amounts required varied between 1/2 and 2 barrels per *mantal*. Similar condition in 1759 resulted in a similar response, leading to a further increase in the number of new establishments. In those counties where the campaign succeeded the governors had instructed the bailiffs and district judges to advocate the creation of new *magasins*. In addition, the dioceses were requested to enlist their pastors in the cause.

During this initial 25-year period, a great many parishes established *magasin*. Most of these grew rapidly thanks to accumulating interest income. Succeeding decades, however, saw a slowdown in the creation of parish *magasins*. The central government ceased to apply pressure. Most of the *magasins* that nevertheless were established appear to have been the result either of county governors acting on their own authority or of local initiatives. The rapid growth of existing *magasins* continued until the 1780s, when the rate of expansion declined markedly.

The first decade of the 19th century, however, witnessed a strong revival of the parish *magasins*. The personal initiative undertaken by the King in 1803, no doubt induced numerous parishes to adopt the institution. During that same period there were substantial increases in agricultural production, grain prices and borrowing from the existing parish *magasins* and borrowing continued to increase during the following decade. During the early 1820s however, this process was reversed. Both prices and borrowing declined, until the end of the decade when they once again turned up. In 1832, a survey conducted by the Royal Academy of Agriculture reported that 890 parishes had *magasins*. This point in time probably represented the culmination of the institution, both with regard to numbers and total assets. Few new *magasins* were established after that point and existing ones started to be discontinued during the 1840s and 1850s. An accelerating decline during the next two decades left very few survivors by the 1880s.

During the initial phase, the newly established *magasins* were concentrated in a limited number of counties in Central Sweden, grouped around the Lake Mälar Valley, including the iron works area *Bergslagen*, as well as the island of Gotland. In less central provinces, such as Östergötland and Västergötland, the start came later and the spread was slower. Only after 1830 was a high degree of coverage attained there. In the peripheral counties of the province of Småland, and the counties Älvsborg, Värmland and Västernorrland, the establishment of *magasins* lagged even more and the coverage was less. Although a few *magasins* had substantial assets per inhabitant, most had not.

Agriculture was the subject of lively political debate during the 18th century. Numerous institutional innovations and reforms were discussed, many of which assumed that central government initiatives were essential. Very few were implemented and most of them are long since forgotten. In view of the long and fruitless discussion of *magasins* during the first half of the century, that idea too might well have been expected to end up in the trashcan. Two questions stand out. Why was the *magasin*

institution successful, both in terms of numbers and longevity? Why did they evolve into something quite different from what their advocates had in mind?

The widespread establishment of *magasins* during the 1750s and 1760s can be explained by the determination of a number of county governors, together with some highly favourable harvests. The voluntary character and independence of the *magasins* was regularly stressed by the central government in order to allay the fears and suspicions of the peasantry.[4] The strong hierarchical element in the establishment process that the county governors exercised was crucial.

A more interesting question is why the *magasins* survived instead of becoming an ephemeral phenomenon like so many other more or less bright ideas of the time. The most likely answer is that, once established, they evolved into something different from what had been intended. The self-government and voluntary character of the institution also meant that central government representatives could exercise little influence over the individual *magasins*. What happened in the parishes was up to the local actors, their incentives and the local demand for the services of the *magasins*. The storage aspect receded into the background, while the granting of agricultural credits rose to the fore. The *magasins* became suppliers of credit rather than poor-relief institutions. As such, they performed two different functions. First, with their profits they helped finance the increasing cost of parish services. Second, their capital permitted them to offer loans that allowed the peasants to avoid the high transaction costs of their grain dealings. It would be an exaggeration to say that the *magasin* institution was particularly well designed for these functions, but, in the absence of better alternatives, they played an important role. Although created at the behest of the central government, this new institution came to serve the needs of the parishes for public services and the peasants for agricultural credits.

In the parishes I have studied, a large percentage of all cultivators of farms with a *mantal* designation borrowed from their *magasins*. Furthermore, this result was largely independent of the size of the holding. An analysis of estate inventories from these same parishes, however, indicates that almost all such loans were small compared to the total estate. Thus, it can be concluded that *magasin* loans were very common, but seldom were a major source of credit.

Most *magasin* charters specified that loans were to be repaid in the fall of the same year as they were taken. The general practice, however, seems to have been different. Most of the loans issued in the parishes studied in chapter 7 had a duration exceeding one year. There is little evidence, however, that these loans were source of long-term credit. During the late 18th and early 19th centuries there was virtually no organized credit market open to peasants. Thus, their long-term financing was dominated by promissory notes. The parish studies also discovered a clear correlation between loan repayments and harvest outcomes.

This suggests another explanation for the length of the *magasin* loans. Apparently borrowers preferred to limit their repayments to good crop years. Even though they had to pay interest, the borrowers preferred to repay their loans when the opportunity cost of the grain was low. It seems reasonable to conclude that their *magasin* loans had more to do with their grain dealings

than with their need for financing. Since such behavior was very common, the *magasins* can hardly have objected. This despite the fact that it clearly violated all those charters that required repayment every fall, except possibly in the case of crop failure. The lack of repayment reduced the ability of the *magasins* to provide new loans, but it had the advantage of yielding interest beyond the fall. There can be no doubt that profit took precedence over grain reserve.

When a peasant with a small holding required additional grain in the spring, he could expect high prices and even difficulties in finding any supply in the "thin" seasonal market. His illiquidity and lack of market information put him at a distinct disadvantage. By contrast, in the fall, when repayment was formally required, there was usually an ample supply, as many sellers sought to raise cash to pay their monetary taxes. These market inefficiencies might result in losses that can be classified as transaction costs. The less well the market functioned, the higher were these costs. The *magasins* gave the peasants a way around these costs, even if their interest rates were higher than those on monetary loans. When prices were rising, these motives were reinforced. This last effect can be seen clearly in the demand for *magasin* loans. During the first decades of the 18th century, when nominal grain prices were increasing rapidly, demand for such loans was strong. In the 1820s, however, when prices were sinking, the demand for loans also decreased.

The rate of interest differed by region. The parishes in and around the metallurgical district of Bergslagen charged only 6¼% compared with the usual level of 12½% (4 *kappar).* Since Bergslagen had a permanent grain deficit, the local peasants had better outlets for their surplus grain. The poorly functioning grain market was a major reason for the peasantry's demand for *magasin* loans. By borrowing and then repaying grain loans, the peasants reduced their need for grain inventories and thus for storage. In effect, they were purchasing storage services from the *magasins.*

It is interesting to note that in both Spain and Italy the heaviest concentration of *monti frumentari* and *positos* was in the areas most isolated from cities and international markets. It can be assumed that such distant regions had the highest transaction costs. In Italy an important motivation for these institutions was freeing the peasants from the jaws of loan-sharking traders. The same motive was apparent in Sweden, and interest rates were lowest where market access was easiest.

One argument used to persuade the peasants to establish a *magasin* and contribute to the initial capital fund was that, once the total *magasin* capital had risen to twice the original amount, they could get their investment back. There are even some examples of such repayments occurring several times, thus providing an excellent return on the invested capital. The usual procedure, however, was to, directly or indirectly, use the profits to support various parish programs. Thus, the extra grain might be sold and the money used to replenish the various parish funds. Most parishes were increasing their role in areas such as poor relief, elementary education and midwifery, all of which required financial support. The early 19th century was a period of strong population growth when particularly the number of poor people increased, so did the cost of their care. In addition, more and more parishes provided instruction in both reading and writing, either by establishing new elementary schools or at least by employing

ambulatory teachers. Finally, the increased reliance on trained midwifes, as well as the spread of vaccination also had to be financed. The lack of institutions capable of raising the revenues required for these services was a serious problem for the parishes. The interest income earned by the *magasin*, as well as the various parish funds, was a welcome addition and generated popular support for the institution. It is interesting to compare Scania and the other formerly Danish provinces with the rest of Sweden. The parishes in the conquered provinces were allowed to retain the third of the tithes that had been their traditional share before the Reformation. They thus continued to have a permanent source of revenue. This parish income is the most likely explanation to the weak, or totally non-existent, interest in establishing *magasins* in these areas.

How the grain market functioned was obviously an important determinant of the demand for grain loans. Although it is difficult to quantify the improvements, there are many indications that the domestic grain trade started to become more efficient sometime during the early 19th century. Price volatility declined and regional price differentials shrank and the movement of prices became increasingly synchronized. In both cases the trend was steadily downward, clear evidence of increased market integration.[5] A trade involving the regular purchase of grain in the countryside emerged, providing a reliable outlet and thus increasing the incentive for peasants to produce a surplus for sale. Largely self-sufficient peasants were transformed into farmers serving a market. This transformation occurred gradually, powered by a number of forces. These can be grouped under such headings as urbanization, the elimination of in-kind tax payments, improved transportation and communications and the general monetization of the economy. The increase in grain exports during the mid 19th century also fostered an organized domestic grain trade with merchants actively purchasing surplus grain from the farmers .

When the markets improved, transaction costs declined. The *magasins* could only survive as long as the conditions that led to their development prevailed. During the last two thirds of the 19th century, however, a number of fundamental changes took root. The grain markets became more efficient. The lack of competition, which previously had disfavored the peasants, was alleviated. As expected, this improvement in markets was accompanied by a decrease in the demand for *magasin* loans. The information available does not permit a precise tipping point to be identified. It does seem clear, however, that these developments were inter-related. When the conditions which once had motivated the *magasins* disappeared, they faded away.

The Local Government Legislation of 1862 created a new framework for local self-government. The existing system was reorganized and strengthened by dividing the parish into separate ecclesiastical and civil authorities. The latter, the *kommun*, provided social services and was empowered to levy and collect taxes. Thus, a new tax base and an efficient system of communal finance was created. The system of distributing parish influence on basis of *mantal*, on which both the parish meetings and the *magasins* had been based, ceased to exist. The *magasins*, quite simply, were difficult to reconcile with the new system and their profits were less important since the new *kommuner* had the right to impose taxes to finance their expenditure. Naturally, this is an important part of the reason why their functions were discontinued.

The relationship between central and local control is an interesting, although complicated, subject that can only be outlined here. During the Early Modern Period the central government had much less effective control than is the case today. Both its role and its resources were limited. Among countries of the time, Sweden belonged to the group with modest central government resources. Long distances and low population density do not provide for good and intense communications, which are essential for a strong central power. Thus, the government's ability to implement institutional change, or to enforce observance of formal institutions, was modest. It is apparent that the Swedish central government would not have been able to require universal establishment of *magasins*, much less exercise control over their activities.

Another factor is the influential political role played by the peasantry, in the Parliament as well as in the *ting* and parish meetings. The mere existence of such peasant influence was unique in Europe. It should, however, not be exaggerated. Still, the opinions of the peasantry could not be ignored, thus constraining the behavior of the central government. Even though coercion was used on occasion, the process of establishing *magasins* can best be understood as a dialogue between government representatives and the parishioners. In the end, the parish could always refuse – and many did. As a consequence, once the *magasin* was established it enjoyed an independent standing. Indeed, the independence of the *magasins*, and their right to make their own decisions, was frequently stressed in the charters, which in many cases had received the solemn imprimatur of the King in Council.

This independence, however, was not without drawbacks. The operations of many parish *magasins* was hampered by a lack of able, honest and dedicated management, as well as by local feuds and rivalries. Indeed, such difficulties probably explain the failure of many *magasins* to flourish. Still, in the absence of such problems, the control system was probably quite efficient. It was common for the detailed accounts, including the list of debtors, to be read at the parish meetings. Every parishioner would then be allowed to make comments and to participate in deciding on the allocation of the profits. In addition, it was possible to adjust the *magasin* operations to accommodate changes in the demand for its services.

Does the *magasin* episode constitute an instance of successful institutional innovation? Not if judged by their intended purpose. In terms of what they actually accomplished, however, the answer is less clear. In many parishes they played a valuable role in helping to finance local government services. Many parishes, however, either lacked *magasins* entirely or had ones that barely functioned. These, obviously, played no significant role in local public finance. The *magasins* also helped growers of grain to overcome some of the failures of contemporary markets, that is why there was a demand for their services. There was an obvious need for new institutions when Sweden entered into the transitional period in the late 18th and early 19th centuries. The *magasins* may not have been an optimal response but once there they could provide a second best solution in the absence of better ones. A clear lesson of this episode is that understanding institutional development requires that both intentions and functional reality be studied.

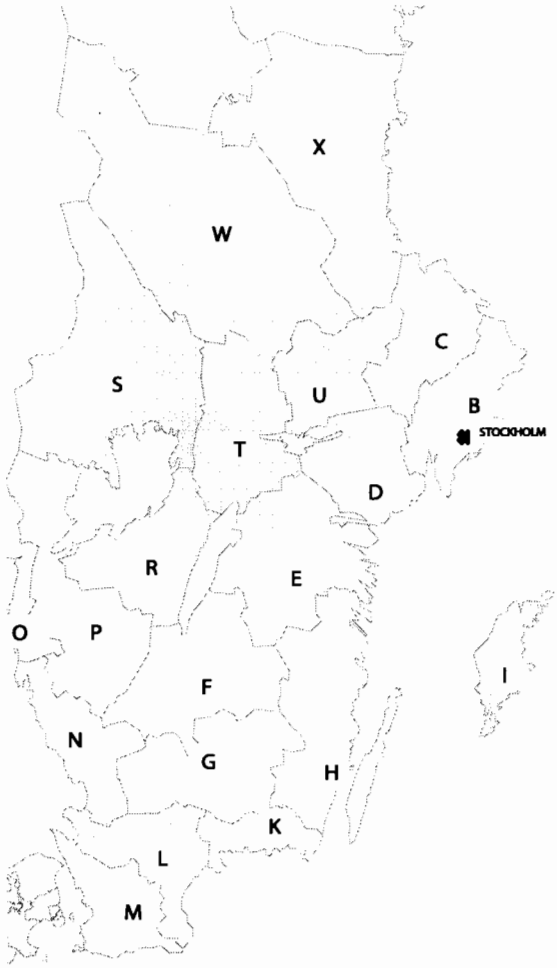
Physical reminders of the *magasin* system can still be found in the Swedish

countryside in the form of neatly refurbished storehouses. They are generally located close to the parish church and often serve as local folk museums. Sometimes a financial trace, perhaps consisting of an unconsolidated fund in the sub-account of some municipality, might be found. But, is that all that remains? Is there no linkage between the *magasins* and modern day institutions, such as savings banks and farmers' cooperatives that share some of their characteristics? At least at the local level, such links are difficult to find. Perhaps, however, the experience of the *magasins* played a general role in encouraging local economic cooperation through popularly controlled institutions. Such cooperation later developed on many fronts and may have contributed to Sweden's relatively tranquil social evolution. But facile answers must be avoided and a great deal of additional critical research will be required before any conclusions along these lines can be drawn.

Footnotes

[1] See chapter 3.
[2] See chapter 4.
[3] Kommerskollegium and Statskontoret.
[4] In practice, however, some county governors displayed a more cavalier attitude towards local rule.
[5] See chapter 8.

APPENDIX A
Counties and Population in 1830



Counties and population 1830		
B	Stockholm	104 090
C	Uppsala	81 742
D	Södermanland	108 327
E	Östergötland	187 609
F	Jönköping	137 478
G	Kronoberg	108 741
H	Kalmar	165 743
I	Gotland	38 954
K	Blekinge	85 734
L	Kristianstad	150 372
M	Malmö	200 103
N	Halland	88 975
O	Göteborg o Bohus	154 054
P	Älvsborg	197 697
R	Skaraborg	167 384
S	Värmland	172 858
T	Örebro	116 255
U	Västmanland	89 262
W	Kopparberg	134 820
X	Gävleborg	102 736

APPENDIX B

Table B.1
Rye Prices: Coefficient of Variation in Swedish Counties 1750–1899.

		1750-74	1775-99	1800-24	1825-49	1850-74	1875-99
B	Stockholm	27.8	12.1	27.4	18.3	20.2	20.2
C	Uppsala	26.2	15.6	26.8	17.3	20.1	22.2
D	Södermanland	24.2	12.1	27.1	18.5	19.7	19.5
E	Östergötland	35.2	15.3	31.6	18.5	21.6	20.3
F	Jönköping	33.7	15.0	30.5	19.6	17.6	19.9
G	Kronoberg	25.9	9.4	23.3	15.3	14.6	18.1
H	Kalmar	31.6	15.2	27.3	17.2	18.6	20.2
I	Gotland	36.9	16.5	25.6	23.8	21.3	21.9
K	Blekinge	31.5	16.8	23.7	17.4	16.9	19.7
L	Kristianstad	33.5	10.6	26.9	18.4	19.0	17.1
L	Ängelholm	35.2	10.5	26.6	19.0	20.0	17.1
L	Simrishamn	38.2	11.9	30.4	21.9	22.9	17.1
M	Malmöhus	41.5	19.7	30.9	22.9	20.0	17.5
N	Halland	29.6	19.3	30.0	18.8	18.0	16.2
O	Göteborg och Bohus	31.3	20.9	32.6	17.5	17.9	17.5
P	Älvsborg	29.6	18.4	31.7	19.2	16.6	18.8
R	Skaraborg	30.7	16.4	31.0	20.8	18.8	20.2
S	Värmland	25.1	16.8	28.8	17.4	16.5	15.1
T	Närke	25.9	14.3	27.6	18.2	19.4	18.8
T	Nora och Linde	26.4	15.3	28.7	17.9	19.2	19.4
U	Västmanland	30.6	13.8	29.4	20.5	19.4	21.8
W	Kopparberg	32.0	13.4	22.9	14.0	16.2	18.0
X	Gästrikland	31.9	15.8	27.2	16.2	17.0	16.3
X	Hälsningland	26.6	11.8	23.8	12.7	15.5	16.4
MEDIAN		31.0	15.3	27.5	18.4	18.9	18.8
QUARTIL 1		26.5	12.1	26.7	17.4	17.0	17.1
QUARTIL 3		33.5	16.6	30.4	19.3	20.0	20.2
QUARTIL 3 - QUARTIL 1		7.0	4.4	3.7	1.9	3.1	3.0

Note: Calculations based on prices in HB.
Source: Jörberg (1972a)

APPENDIX C

Is the Harvest Data Reliable?
A Critical Examination of the Sources.

Estate Accounts

Heckscher (1949) provides yield ratio values *(korntal)* for a few large estates based on their account books preserved in the Swedish National Archives (RA)[1]. The CV of the yield ratios for rye were previously presented in table 3.1. In addition to his series for rye, Heckscher reports a series of combined yield ratios for rye, barley and oats. This reaches a maximum value of 43.2 for Rydboholm in 1765 and of 40.4 for Skarhult in 1758. For those same years the reported value for rye alone (normally at least half the total harvest) was 12 for Rydboholm and 20 for Skarhult. These numbers imply that the yield ratio for barley and oats was approximately 70 for Rydboholm and 60 for Skarhult. Values that high, however, are extremely improbable. Nothing even approaching them are reported in Slicher van Bath's survey, based on no less than 11000 yield ratio observations taken from the literature on European agricultural history and covering the thousand years between 810 and 1820.[2] Furthermore, after inspecting Heckscher's sources, I am at a loss to explain how he calculated the total harvest yield ratios. Consequently, I am disregarding them as regards barely but the values for rye have been maintained.

Tithe Accounts

Previous Research

The usefulness of the tithe accounts has long been a subject of dispute among Swedish historians. In the 1870s and 1880s the founder of economic history in Sweden, Hans Forsell, pioneered a new avenue of research on harvests when he published a number of works on the 16th century making extensive use of the tithe accounts. Huss, one of his successors, also held the tithe accounts in high regard as a source for the study of agrarian history. In the first part of his Economic History of Sweden, published in 1935, Heckscher's harsh criticism of his predecessor included, but certainly was not limited, to the latter's reliance on the tithe accounts.

Having criticized Forssell's population estimates, Heckscher went on to say: "Still more difficult to evaluate is to what extent the harvest values are correct. A real measurement of the harvest was certainly not made, and if we only had the general harvest values as expressed in the tithe accounts as a basis there can be no doubts that we would not only get incorrect results, but also incorrect in one clear direction and that is far too low." [3]

In 1953 Folke Dovring continued along the same lines: "Unfortunately, the assumption that the tithe truly amounted to one tenth of the harvest places too much trust in the taxpayer honesty of the day. In those cases where we somehow can check the results, it is generally the case that we were wrong to assume that the tithe data correctly reflected the harvest outcome, or even was consistent over a wide area. It is significant that the tithe turns out to have been larger in places where the control was stricter. If the vicar simply accepted was offered, he would receive less than if he had the number of shocks in the field checked; the best result was achieved when a sample of the shocks was then test threshed under dependable supervision. Even with elaborate controls, however, we cannot totally free ourselves of the suspicion that the tithe deliveries were short. Under all circumstances, the harvest estimates based on the tithes are on the small side. How far below the actual values they fall is often impossible to know." [4].

In 1949 the work of Helmfrid seemed to turn the tide. After very carefully examining a couple of farms in one parish in Östergötland, he concluded that at least in that case the tithe accounts presented a reasonably accurate picture of reality in that particular case. He was careful, however, to emphasize that, since practices varied greatly among different parts of the country and at different points in time, this conclusion could not automatically be generalized.

In his study of an area in the province of Närke, Hannerberg followed a number of criticisms with the conclusion that the tithe accounts were "as reliable as contemporary agricultural statistics".[5] Whether this inscrutable remark should be taken as a vote of confidence or as damning with faint praise remains a mystery, at least to me. Some year later, in 1971, he was able to recommend that quantities from the tithe rolls be increased across the board by 30%.[6]

In his 1964 study of peasant tax payments in a number of parishes in the province of Uppland during the 17th century, Klas Ågren adopted a positive, although very cautious, attitude. He noted that the first step necessarily was to consider the nature of the problem. For some purposes, the drawbacks of the tithe accounts might not matter. Comparisons over long periods of time should be avoided, but year-to-year variations are less problematic. Even the latter, however, might be disturbed in years when the unit of measurement was changed.[7] In 1972, while debunking Ekman's series, Larsson observed that "It is only the tithe records that provide an acceptable basis for a quantitative estimation of the harvest outcomes in the regions under investigation."[8]

In 1977 Österberg noted that tithe payers sometimes "vanished" from the rolls, thus tending to reduce the reported overall level of production. She was of the opinion, however, that reliance on figures such as per capita tithe payments would permit an accurate estimation of harvests over time. Isacson, writing in 1979, discussed some of these aspects in a generally favourable tone and, on the whole, saw no problems in using the tithe rolls to make comparisons between the 17th and 18th centuries, at least in the parish he studied[9]. In 1991, Myrdal and Söderberg

used tithe accounts from the 16th century and expressed the opinion that these were a close-to-perfect source on harvest outcomes. They did concede, however, that peasants might on occasion fraudulently withhold some of their harvest.[10] During the 1990s, however, the tide of scholarly opinion once again turned.

Two studies from Gothenburg University put the tithe rolls under a critical microscope. Palm (1993) studied Mark in Västergötland while Rantanen examined an area in southern Österbotten. These two authors agreed that a wide gulf separated the true harvest values from those reported in the tithe accounts. According to Palm, in at least some areas, the Crown settled for much less than the 1/15 it was generally assumed to have received. Some years the entire tithe would be remitted. At other times it might be conferred on the nobility, never being entered into the accounts at all. Moreover, certain groups, such as the clergy, settled military personnel and the indigent were entirely or partly exempt from paying the tithe. This list might also be expanded in a given year depending on the harvest. According to Palm, these exemptions were particularly troublesome because practice changed over time and it certainly varied from region to region. On occasion the harvest also was calculated net of the seed expended. Palm cites one, probably extreme, case where what was included in the tithe reports only amounted to a quarter of the likely normal harvest. In other cases, the short fall was estimated to be 60%. On the whole, Palm dismisses the tithe accounts as worthless.

Rantanen (1997) has calculated harvests for a number of parishes during the years 1732 to 1752 using two different methods. One of these is based on data for average yield ratios together with the quantities of seed used, while the other relies on the tithe accounts. The striking outcome is that the former approach results in harvest estimates that are more than twice as large as the latter. Rantanen also observes that harvest fluctuations calculated from the crown tithes show a similar pattern to those for the tax district of Korsholm.[11] This is an argument in favour of the contention that the tithe series reflects harvest fluctuations resulting from variations in growing conditions. This, of course, does not exclude the possibility that common practices kept the crown tithes at a level well below actual production.

Leijonhufvud's 2001 study is based entirely on county level tithe accounts, only using manorial records as a check on the results. She concludes: "Although it is only with difficulty that tithes can be used to calculate production quantities, which in turn might be used to calculate consumption standards, they could give a glimpse of the general *trend* (L.L.'s italics) of production. The tentative description of estimated consumption demand does not particularly favour the tithes as a fruitful source to use".[12]

Some Further Investigations

One apparent conclusion of this whole discussion is that the usefulness of the tithe records varies with time and place. It also seems apparent that the scholars associated with Uppsala University have been less critical of this material than have their compatriots at Gothenburg University. Being located in Stockholm I feel entitled to some comments of my own on the reliability of the tithe rolls. In

1630 the parishes of Munktorp, Torpa and Björkskog, all located in Västmanland county, began to estimate their harvests by counting the number of shocks of grain in their fields and then multiplying that number by a fixed amount of grain per shock. Originally, each shock was assumed to equal 0.25 Swedish barrels of grain. This amount was raised to 0.31 barrels per shock in 1717.[13] As reported by Lindgren (1971), this use of a fixed multiplier was abandoned in 1725. Starting then, sample shocks from each peasant household were threshed to determine their actual grain content. The average result was then multiplied by the number of shocks to determine the total harvest. This change might have had far reaching implications, a possibility that can be studied using the parish of Munktorp. Table C.1 contains data I have extracted from that parish's tithe rolls and the implied average grain content of the shocks.

Table C.1
Average Shock Size in Munktorp, 1721–1734

	Rye			Barley		
Year	Calculated Harvest, Barrels	Recorded No. of shocks	Average shock size, Barrels	Calculated Harvest, Barrels	Recorded No. of Shocks	Average Shock size, Barrels
1721	2340	7491	0.31	1496	4790	0.31
1722	2400	7680	0.31	1529	4893	0.31
1723	1389	4447	0.31	821	2627	0.31
1724	1712	5478	0.31	959	3067	0.31
1725	2570	5680	0.45	1232	3603	0.34
1726	2204	4046	0.54	498	1345	0.37
1727	4709	8191	0.57	1841	3090	0.60
1728	3731	5769	0.65	1981	2748	0.72
1729	4284	7106	0.60	2247	3312	0.68
1730	3878	6598	0.59	2091	2828	0.74
1731	3705	6052	0.61	2816	3696	0.76
1732	5289	9669	0.54	2079	3875	0.54
1733	3111	5053	0.62	2127	2937	0.72
1734	3438	6876	0.50	2301	3176	0.72

Note." Calculated harvest" is recorded tithe multiplied by 15.
"Average shock size" is calculated harvest divided by No. of shocks
Source: Avkortningsböcker, Uppsala Universitet. Total harvest is calculated by multiplying the Crown tithe.

Comparing the variability of the number of shocks and the total harvests shows a pattern difficult to explain. In the case of rye both variables varied in a very similar way, but for barley the number of shocks varied much less than the total harvest did. The difference can be seen in table C.2 below. This observation indicates that there is a risk that when making estimates based on the number of shocks not only the total volume but also the variability of the harvest could be under estimated.

Table C.2
Variability of Harvests and the Number of Shocks in Munktorp

	Coefficient of variation. Munktorp.			
	Harvest Rye	Shocks Rye	Harvest Barley	Shocks Barley
1725-34	25.3	24.6	33.2	23.2
1750-59	36.6	35.6	36.2	22.4

Source: See table 3.5 and figure 3.1.

A further observation based on my detailed work with the tithe records from Munktorp is that the shock size applied also depended on the social and economic position of the tithe payer. For crofters and widows an apparently arbitrary and fixed shock size of 15 *kappar* (0.47 barrels) was used. This may have been because test threshing made no sense for such small production units. It was also the case that "persons of rank" (ståndspersoner), particularly if they were involved in tax administration, consistently benefited from much lower grain content multipliers than any other group. The effects of these practices on the calculated total harvest, while not huge, were certainly noticeable.

Another test of the tithe series was to compare that from Uppsala-Näs parish with the values reported by Wallerius. (Wallerius' farm and Uppsala Näs were neighbours).

Table C.3
Comparisons Between the Wallerius Farm and the Parish of Uppsala Näs 1748-77.

	Wallerius' fram	Parish Uppsala Näs	Correlation
	cv	cv	r
Rye	0.31	0.44	0.62
Barley	0.38	0.34	0.80

Source:Wallerius (1779) and Hegardt (1975).

The correlations for barley are at least as high as might reasonably be expected. In addition, the cv values are similar. In the case of rye, the correlations are weaker, apparently as a result of much greater volatility within the parish. These results might well reflect the more sophisticated techniques utilized by Wallerius, rye obviously being more sensitive than barley to the skill of the cultivator. These two examples fail to provide any support for rejecting the reliability of the tithe records as indicators of annual harvest fluctuations.

Olsson (2005) has published several series of clergy tithes covering the period from 1734 to 1803, based on the records of two parishes in southwest Scania, Hög and Kävlinge. Within these parishes it is possible to identify a number of individual farms, thus permitting the study of harvest volatility at the household level. Strikingly, Olsson's results display much less volatility than do those from

other estates and farms. This raises some interesting questions. Does the measured difference in volatility reflect substantially lower actual volatility in Olsson's parishes, or was it the result of different methods of assessing and recording harvests for the tithe? Conversely, was there something about the administrative methods applied in the other parishes that tended to exaggerate their reported volatility?

Thus, these much lower volatility results could be explained either by more stable harvests, likely the result of milder and more reliable weather or superior cultivation techniques, or else by different measuring and recording procedures. In a previous study, however, Olson had reported that during roughly the same period the demesne at Vitskövle, 50 kilometres away, had much higher volatility values (see table 3.1). That table also indicates that Skarhult, an estate studied by Heckscher and located only 10 kilometres away, had even higher measured volatility. There is nothing in these results pointing towards particularly low volatility in Scania.

Table C.4
Coefficients of Variation Compared

	Estate Accounts, see Table 3.1	Munktorp	Hög	Kävlinge
Barley				
Individual units, Median	34	40	22	19
Parish value		27	17	15
Rye				
Individual units, Median	41	42	25	21
Parish value		35	11	17
Rye and Barley				
Individual units, Median		41	20	18
Parish value		30	17	13

Sources: Table 3.1, table 3.3 and Olsson (2005).

What was measured in Hög and Kävlinge was not the final harvest of grain, threshed and packed into barrels or sacks, but shocks in the fields (*travar*). The study of Munktorp indicates that the grain content of a shock could vary substantially and that there was a tendency to underestimate harvest variations at least as regards barley when measurements were based solely on shocks. Another difference is that the tithes recorded in Scania went to the local pastor, who assessed and collected them, while the Munktorp tithes accrued to the Crown. Research currently in progress at Lund University may be able to determine the reason(s) for these observed volatility differences.

Footnotes

[1] Börstorpsamlingen, RA.
[2] Slicher van Bath (1963).
[3] Heckscher (1935) p. 89. "Ännu svårare är det kanske att bedöma, i vad mån skördesiffrorna själva äro riktiga. Någon verklig uppmätning av skörden som helhet gjordes ganska säkert icke, och om man endast hade de allmänna skördesiffrorna, såsom uttryckta i tiondelängderna, till underlag, kan det icke vara något tvivel om att man finge icke blott oriktiga utan i en bestämd riktning oriktiga resultat, nämligen alldeles för låga".
[4] Dovring (1953) p. 41 "Men tyvärr innebär antagandet att tionden verkligen var en tiondedel av skörden ett väl stort förtroende för skattemoralen i äldre tider, i de fall där vi på något sätt kan kontrollera saken, visar det sig i regel att vi inte har rätt att förutsätta att tiondesiffrorna återspeglar skörderesultaten korrekt, eller ens på ett sätt som är likformigt över större områden. Betecknande är att det visat sig att tionden är högre där kontrollen är noggrannare. Om prästen bara tog emot vad man erbjöd honom, fick han mindre än om han själv lät kontrollera antalet skylar ute på fältet; bäst blev resultatet om några av skylarna sedan provtröskades under pålitlig kontroll. Men även vid en utvecklad kontroll kan vi inte helt avvärja oss från misstanken om underslev vid tiondeleveranserna. Den uppfattningen om skörden som tionden ger oss ligger i alla fall i underkant. Hur långtunder verkliga värdena den ligger är ofta omöjligt att veta."
[5] Hannerberg (1941).
[6] Hannerberg (1971) p. 81.
[7] Ågren (1964) p. 212 f.
[8] Larsson (1972) p. 151 "Det är enbart tiondelängderna som ger en acceptable grundval för en kvantitativ bedömning av skördeutfallet i de aktuella undersökningsregionerna."
[9] Isacsson (1979)
[10] Myrdal/Söderberg (1991) p. 71. "tiondelängden kan anses för ett ganska fullvärdigt källmaterial rörande skördeutfallet, även om man inte kan bortse från att ett visst underslev ibland kan förekomma"
[11] Rantanen (1997). "skördefluktuationer beräknade efter kronotiondet visar ett likartat monster i Korsholms fögderier." Det talar för att tiondeserierna återger faktiska naturbetingade skördevariationer i regionen. Men det hindrar förstås inte att det också kan ha funnits ett gemensamt mönster för undanhållande av kronotionde.
[12] Leijonhufvud (2002) p. 262.
[13] Hegardt (1975) p. 28.

APPENDIX D
Elasticy

Translating harvest outcomes and supply levels into prices requires a demand schedule. While such a schedule can never actually be estimated, it is possible to make some reasonable assumptions. It is generally agreed that the price elasticity of demand for grain was low in absolute value. How low, however, is not clear. The King-Davenant demand schedule discussed in chapter 4 has an implicit price elasticity of -0.4. Empirical evidence supporting just that value, however, is hard to come by. More recently, Person (1999) has suggested that an elasticity of -0.6 (±0.1) is "plausible" for the Early Modern Period. He has thus distanced himself from Robert Fogel's contention that an elasticity of -0.2, or even less, was likely.[1] Here it can be noted that a linear regression on Engle's data for Prussia yields an elasticity of -0.6 in the vicinity of the mean harvest.[2]

Fogel also argues that the market demand curve represents the summation of many different schedules. Poor people who themselves produced no grain had very little money, certainly must have had rather elastic demand schedules, while those of rich people were no doubt highly inelastic. Since he relates total demand to the gross harvest, he also estimates the demand for seed and for feed for draft animals. Both these types of demand are extremely inelastic. The elasticity of aggregate demand thus depends on the elasticities of the various sub-demands and the weights that are used to combine them. Despite the uncertainty concerning both the magnitude and the elasticity that applies to each of these sub-demands, I think it is useful to discuss reasonable assumptions for them in order to gain some perspective on the suggested overall figures.

Two alternative elasticity values, -0.4 and -0.6, are posited. What each of these implies for the various categories of grain use is displayed below.

Table B.1

	Alternative 1			Alternative 2		
	Share of average Consumption	Elasticity	Contribution to total elasticity	Share of average Consumption	Elasticity	Contribution to total elasticity
Seed corn	0.2	0.005	0.001	0.2	0.005	0.001
Feed for draft animals	0.05	0.005	0.00025	0.05	0.005	0.00025
Price insensitive groups	0.15	0.1	0.015	0.1	0.1	0.01
Big farmers' consumption	0.2	0.4	0.08	0.15	0.5	0.075
Small farmers' consumption	0.3	0.65	0.195	0.35	0.9	0.315
Poor, land less people	0.1	1	0.1	0.2	1	0.2
Sum	1		0.4	1		0.6

1) Under both total elasticity alternatives, an extremely low demand elasticity of -0.0005 is assumed for seed as well as for draft animal feed. This reflects the belief that seed and animal feed needs would be satisfied with virtually no regard to price. The 20% harvest share going to seed implies a yield ratio of 5, which is probably realistic for the period being studied.

2) There was, of course, a population of poor, landless people whose poverty made them utterly dependent on grain, the cheapest foodstuff available. That is they spent what little money they had on grain. When prices rose, they had to cut back their purchases almost proportionately, and then go hungry. They thus must have had a rather elatic demand. It is difficult to estimate this group's exact share of grain consumption under normal conditions, but 10% and 20% respectively are assumed.

3) At the other end of the income scale there was a segment of society whose consumption was effectively unconstrained by prices. Their virtually insensitivity to grain price levels, of course, meant that their demand was extremely inelastic. Like the previous group, their share of consumption is difficult to estimate. The assumptions made here is that they represented 15% and 10% of normal grain consumption respectively.

4) Most of the grain consumed by the agricultural population never passed through the market. All grain, however, whether marketed or not, should be included in this analysis. Consumption by self-sufficient households can be viewed as a case of the farmers buying from themselves at a price equal to their opportunity cost. There were, of course, differences in wealth within this segment of the population. In addition, they had, to varying degrees, access to other sources of food. These included gardening, animal raising, hunting and fishing in rivers, lakes and the adjacent Baltic Sea. All these factors must have affected their price sensitivity. It is assumed here that this population consumed approximately 50% of the total grain crop. They are, however, split into two groups, large farmers and small farmers with different elasticities. To varying degrees under the two total elasticity assumptions, the small farmers are assumed to have a more elastic demand than their large compatriots. Their share of each in the total consumption of grain also differs between the two total elasticity assumptions.

These calculations can be seen as a test whether the assumptions can be justified as reasonable.

Fogel's suggestion that the total price elasticity of the demand for grain was -0.2, or possibly even less, is unconvincing. He uses the formula . $e = s_q / s_p * r_{qp}$ to arrive at his conclusion[3]. This calculation, however, requires some strong assumptions. In particular, only harvest outcomes are allowed to affect prices. When other factors, such as imports and exports, play a role, the correlation between harvests and prices $r_{qp,}$ falls below one, causing a decline in demand elasticity. Why this should be the case is hard to understand.

It is easy to accept Fogel's contention that many previous authors have relied on too small a geographic area when measuring grain output, thus tending to overestimate the volatility of supply. Based on calculations utilizing British agricultural statistics for the period 1884–1913, he assumes a harvest CV in the

range between 3 to 5. These values are extremely low. It is interesting to note that Mitchell, who published the British data used by Fogel, observes that: "Certainly it is likely that the year-to-year fluctuations in yields are underestimated as a result of the reporter's judgement. There seems to be a fair amount of evidence that they overestimate yields in bad harvests and underestimate those in good years".[4] These values can also be compared to those reported for other countries during roughly the same period. In Sweden, for the period 1865–1910 the CV for all grains was 10.1 and for rye alone it was 9.5. In the case of Prussia during 1847–1861, the CV for rye was 18.9.

National harvest data is only equivalent to supply if there is a truly integrated national market. What matters is the volatility of the supply available in given geographical markets, not the total harvest. Assuming total national market integration might be reasonable for late 19th century England with its extensive canal and railway networks. It seems less realistic for the 16th century. Had Fogel used a harvest CV of, for example, 10, instead of the very low figures he relies on, his equation would have yielded an elasticity of -0.56. That value, of course, falls within the range used in my analysis. Given such an outcome, it is difficult to accept elasticity values with an absolute of value of less than 0.4.

Footnotes

[1] Fogel (1992).

[2] Engel (1861).

[3] Fogel (1992). Where s_q signifies the standard deviation of the supplied quantity, s_p the standard deviation of the price, and r_{qp} the correlation coefficient between quantity and price.

[4] Mitchell (1962) p. 72.

APPENDIX E

Harvest Index

In order to relate the price movements in Stockholm to the domestic supply an index with estimations of harvest variations in eastern Sweden has been calculated. It is based on the parish tithe rolls discussed in chapter 3 and checked against available qualitative sources. The values range from +2 to –2, which is 5 different grades. It is unavoidable that such an index is arbitrary in its details.

For each parish an index was calculated where each year's harvest is related to the mean of the ten preceding years. The median value of these parish indexes is then used. Median values within the range of 87.5–112.5 were classified as 0. Median values below 75 were classified as -2 and above 125 as +2, and median values between these categories were classified as either -1 or + 1.

The frequency distribution of the index values is displayed in Fig D.1 below.

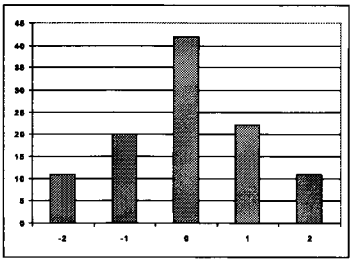


Figure D.1
Harvest Index 1655-1760. Frequency Distribution. Per Cent.

APPENDIX F

Frequently Used Swedish Terms for Institutions.

Härad, An institution on ancient origin generally consisting of a number of parishes at the level below the bailiwick and the county. Representatives of the parishes in the *härad* convened at the *ting.*

Kappe, pl. *Kappar,* Grain measure, 1 /32 of a barrel.

Mantal, "Taxes were based on the number of *mantal,* or standard taxable units, occupied by a landed peasant or any other landholding individual. Originally a *mantal* was equivalent to the amount of land a peasant and his household needed to control in order to be regarded as a 'fully propertied', self-supporting holder. This measure varied geographically and was set by surveyors and tax authorities based on their perception of local land productivity. The measure, which had lost its original meaning by the 19th century, differed greatly, even within relatively homogeneous areas " Pred (1986).

Ting, meeting of representatives from the parishes of the *härad* for court proceedings or discussions on issues of common interest including dialouge with representatives of the central government.

Abreviations

CA, Church Archive (Kyrkoarkiv)

CG, County Governor (Landshövding)

CV, Coefficient of Variation, (Standard Deviation x 100 / Mean value)

dlr smt, Daler silvermynt

dlr kmt, Daler kopparmynt

Gla, Göteborgs landsarkiv (The Regional Archives in Göteborg)

HB, Reichsthaler Hamburg Banko = value of 25,89 grams of fine silver

KK, Kammarkollegium (The Board for Public Lands and Funds)

KLNA, Kulturhistoriskt lexikon för nordisk medeltid

KM, Kungl Maj:t, (The King in his institutional governance function, "the government").

KSLA, Kungl. Skogs- och Lantbruksakademin (Royal Academy of Agriculture and Forestry)

R, riksdagsarkiv (Diet records, unprinted)

RA, Riksarkivet, (The National Archives)

rdr rgs, riksdaler riksgälds

rdr bko, riksdaler banko

RH, riksdagshandlingar (printed Parlamentary documents)

SD, Standard Deviation

SEK, Swedish Crowns

Ssa, Stockholms stadsarkiv (The Stockholm City Archives)

Ula, Uppsala landsarkiv (The Regional Archives in Uppsala)

Vala, Vadstena landsarkiv (The Regional Archives in Vadstena)

Vila, Visby landsarkiv (The Regional Archives in Visby)

Archival Sources

Riksarkivet (RA) (The National Archives)
Börstorpssamlingen
Kammarkollegium (KK)
Kommerskollegium,
  Kammarkontor, Berättelser om utrikes handel och sjöfart
Landshövdingarnas skrivelser till KM (CG to KM)
Likvidationskommissionen
Länsräkenskaper
  Verifikationer
Riksdagshandlingar (R)
Sammansatta kollegiers skrivelser till KM
Statskontoret
Tabellverket
  Tabellkommissionens berättelser till KM.

Landsarkiv (Regional Archives)

Landsarkivet i Göteborg (Gla)
Kyrkoarkiv (CA): Brevik, Lerbäck, Särestad

Stockholms stadsarkiv (Ssa)
Kyrkoarkiv (CA): Estuna, Fresta, Husby-Lyhundra, Husby-Ärlinghundra, Lohärad, Skederid, Spånga, Österåker.

Landsarkivet i Uppsala (Ula)
Västmanlands län
  Landskansliet
  Domböcker: Norrbo härad, Skinnskattebergs härad.
Hagunda härad
  Bouppteckningar
Kyrkoarkiv (CA): Altuna, Badelunda, Balingsta, Biskopskulla, Björklinge, Björkvik, Blacksta, Börje, Floda, Giersta, Gottröra, Gryta, Hagby, Knivsta, Lid, Lundby, Munktorp, Säby, Viksta, Willberga, Vittinge, Yttergarn, Åkerby, Östuna.

Landsarkivet i Vadstena (Vala)
Östergötlands län, landskansliet
Kyrkoarkiv (CA) Askeby, Banekind, Hörreda, Mellby, Stora Åby, Sund.

Landsarkivet i Visby (Vila)
Länsstyrelsen
Landskansliet
Landskontoret
Handlingar om sockenmagasin
Södra häradet:
Domböcker,
Bouppteckningar
Kyrkoarkiv (CA): Atlingbo, Buttle, Vänge.

Other Archives

Fållnäs gårdsarkiv (Private Estate Archive)
Accountancy books

Hedemora kommunarkiv
Husby socken, Magasinshandlingar

Kungl. Skogs- och lantbruksakademins arkiv (KSLA)
(Royal Academy of Agriculture and Forestry)
Inkomna uppgifter rörande sockenmagasinen

Nordiska Museets arkiv
Gårdsarkiv: Kimstad, Ödeshög

Säters Kommunarkiv
Magasins handlingar

Uppsala universitets arkiv
Avkortningsböcker

Internet Sources.

Statistics Sweden, web-site,
http://www.scb.se/templates/tableOrChart____26046.asp
Unger web-site, www.history.ubc.ca/unger/htm_files/new_grain.htm

References

Allmänna svenska landtbruksmötet (1858), Frågor framställda till öfverläggningsämnen vid åttonde allmänna landbruksmötet. Jönköping.

Anes Alvarez, Gonzalo (1969), *Economia e „Ilustración" en la España del siglo* XVIII. Barcelona.

Aronsson, Peter (1992), *Bönder gör politik.* Lund.

Avallone, Paula (2003), *Primitive forms of agrarian credit. The Monti Frumentari in the Kingdom of Naples.* Napoli.

Axelson, G. E. (1888), *Bidrag till kännedomen om Sveriges tillstånd på Karl XII:s tid.* Visby.

Bang, N. E. and Korst, K.(1906–1933), *Tabeller over skipsfart og varetransport genom Öresund 1497-1660*, 3 vols. Köbenhavn /Leipzig.

Bang, N.E. and Korst, K.(1939–1945), *Tabeller over skipsfart og varetransport genom Öresund* 1661-1783 *og genom Storebelt 1701-1748.*, 3 vols. Köbenhavn / Leipzig.

Bardhan, Pranab (1989), *The economic theory of agrarian institutions.* Clarendon Press. Oxford.

Bauernfeind, Walter (1993), *Materielle Grundstrukturen in Spätmittelalter und der Frühen Neuzeit.* Schriftenreihe des Stadtsarchivs Nürnberg. Nürnberg.

Beck, Ulrich (1986), *Risikogesellschaft.* Frankfurt am Main.

Berg, Wilhelm (1885), *Visingsö.* Göteborg.

Bergström, Eric (1818), *Tankar om socken-magazins-inrättningar.* Uppsala.

Bergström, Eric (1827), *Minnesteckning öfver f.d. häradsprosten i Hagunda contract...*Uppsala.

Bergström, Karin (1991), *Lantprästen.* Kristianstad.

Bergström, Karin (1992), *Kyrkplatsen som socknens centrum.* Trelleborg.

Brasch, Erik (2003), *Jordbruksrationalisering under frihetstiden.* Jönköping.

Brolin, Per-Erik (1954), "Omdömen om skördarna i Sverige under 1700-talet och början av 1800-talet". *Statistisk Tidskrift No 10.*

Carlsson, Sten (1973), *Ståndssamhälle och ståndspersoner* 1700–1865. Lund.

Dovring, Folke (1953), *Agrarhistorien.* Uppsala.

Ebeling, Dietrich, and Irrsiegler, Franz (1976), "Getreideumsatz, Getreide- und Brotpreise in Köln 1468-1797". in *Mittelungen aus dem Stadtarchiv von Köln.* Köln

Enciclopedia Universal Ilustrada Europeo-American Tomo XLVI. (1922), *Postios.* Madrid

Enequist, Gerd (1975), *Mälarlänens lantbebyggelse enligt det äldre ekonomiska kartverket.* Uppsala.

Engel, Ernst (1861), "Die Getreidepreise, die Ernteerträge und die Getreidehandel in preußischen Staate," in *Zeitschrift des Königlich preußischen statistischen Bureaus.* I

Englund, Peter (2000), *Den oövervinnelige.* Stockholm.

Fogel, R.W. (1992), "The conquest of High Mortality and Hunger in Europe and America: Timing and mechanisms" in S.R.Osmani (ed.) *Nutrition and Poverty.* Clarendon Press. Oxford.

Frohnert, Pär (1993), *Kronans skatter och bondens bröd.* Lund.

Fridlizius, Gunnar (1957), *Swedish Corn Export in the Free Trade Area.* Lund.

Furtak, T. (1935), *Ceny w Gdansku w latach,* 1701–1815. Lwow.

Gadd, Carl-Johan (1999), "Svenskt jordbruk och svensk statistik i slutet av 1700-talet." In ed U. Jorner, *Svensk jordbruksstatistik* 200 *år.* Stockholm.

Gadd, Carl-Johan (2000), *Den agrara revolutionen.* Stockholm.

Gasslander, Olle (1949), *J. A. Gripenstedt. Statsman och företagare.* Lund.

Gullstrand, Ragnar (1923), *Bidrag till den svenska sockensjälvstyrelsens historia under* 1600*-talet.* Stockholm.

Hammar, Åke (1860), *Socken-statistik öfver Sverige.* Stockholm.

Handlingar rörande inrättandet af socken- eller districts-magazin. (1833). Stockholm.

Hannerberg, David (1941), *Närkes landsbygd 1600-1820.* Göteborg.

Hannerberg, David (1971), *Svenskt agrarsamhälle under 1200 år.* Stockholm.

Hayami, Yuiiro, and Ruttan, Vernon W. (1985), *Agricultural Development.* Jon Hopkins University Press.

Heckscher, Eli F. (1936), *Sveriges ekonomiska Historia. Första delen.* Stockholm..

Heckscher, Eli F.(1949), *Sveriges ekonomiska Historia. Andra delen.* Stockholm.

Hegardt, Astrid (1975), *Akademins spannmål.* Uppsala.

Helmfrid, Björn (1949), *Tiondelängderna som källa till ett byalags ekonomiska historia 1555-1753.* Stockholm.

Hellstenius, J. (1871), "Skördarna i Sverige och deras verkningar." *Statistisk Tidskrift.*

Hoskins, W.G. (1964), "Harvest Fluctuations and English Economic History, 1480–1619". in *The Agricultural History Review Vol. XII.*

Hoskins, W.G. (1968), "Harvest Fluctuations and English Economic History, 1620–1759." in *The Agricultural History Review Vol. XVI.*

Högberg, Staffan (1969), *Utrikeshandel och sjöfart på 1700-talet.* Stockholm.

Höjeberg, Pia (1981), *Jordemor. Barnmorskor och barnaföderskor i Sverige.* Södertälje.

Höijer, E. (1921), "Sveriges uppdelning på naturliga jordbruksområden." *Statsvetenskaplig Tidskrift.*

Imhof, A.E. (1976), *Aspekte der Bevölkerungsentwicklung in den nordischen Ländern 1720-50.* Bern.

Isacson, Mats (1979), *Ekonomisk tillväxt och social differentiering 1680-1860.* Uppsala.

Jansson, Arne, Söderberg, Johan et al. (1991), *Dagligt bröd i onda tider: Priser och löner i Stockholm och Västsverige.* Institutet för lokalhistorisk forskning. Göteborg.

Jevons, Stanley (1931), (1871) *The Theory of Political Economy.* Macmillan and Co.

Johansson, K.H. (1937), *Svensk sockensjälvstyrelse 1686-1862.* Lund.

Jones, E.L.(1964), *Seasons and Prices.* George Allen & Unwin. London.

Jutikkala, Eino (1955), "The Great Finnish Famine in 1696–97." in *The Scandinavian Economic History Review III.*

Jörberg, Lennart (1972a), *A history of prices in Sweden 1731–1914. Volume I.* Lund.

Jörberg, Lennart (1972b), *A history of prices in Sweden 1731–1914. Volume II.* Lund.

Kablukow, Nikolai (n.d.), "Die Russishe Gesetzgebung betr. die Versorgung des Volkes bei Missernten" in *Archiv für Soziale Gestezgebung und Statistik* IV Band. Berlin.

Kahan, Arcadius (1985), *The Plow and the Hammer and the Knout.* Chicago University Press.

Klose, Gunilla (1992), *Folkundervisningens finansiering före 1842.* Lund.

Krantz, Olle (1986), *Historiska nationalräkenskaper för Sverige: Transporter och kommunikationer 1800-1980.* Lund.

Kulturhistoriskt lexikon för nordisk medeltid. 1–22, 2nd ed (1980–82), Copenhagen.

Kongl. Maj:ts nådige påbud angående magaziners inrättande.(1716).

Landshövdingarnas femårsberättelser 1822–1855.

Larsson, Lars Olof (1972), *Kolonisation och befolkningsutveckling i det svenska agrarsamhället 1500-1640.* Lund.

Leijonhufvud, Lotta (2002), *Grain Tithes and Manorial Yields in Early Modern Sweden.* Uppsala.

LeRoy Laudrie (1983), *Histoire du Climat depuis l'An Mil.* Flammarion. Paris.

Lindberg, Lotta (2004), *Sockenmagasinen i Stockholms län.* Konstvetenskapliga institutionen. Stockholm.

Lindgren, Håkan (1971), *Spannmålshandel och priser vid Uppsala akademi 1720–1789.* Uppsala.

Lindgren, Håkan (1976),"1600-talets agrarkris i svensk belysning." *Historisk Tidskrift.*

Lindgren, Håkan (2002), "The Modernization of Swedish Credit Markets, 1840–1905: Evidence from Probate Records," in *The Journal of Economic History* Vol 62, No.3.

von Linné, Carl (1985), *Gothlandska resa.* En antologi sammanställd av Bertil Gullander. Höganäs.

McCloskey, D. (1989), "The open Fields of England: Rent, Risk, and the Rate of Interest, 1300–1815." in D.W Galenson ed. *Markets in History.* Cambridge University Press.

McCloskey, D., (1991), "The prudent Peasant: New Findings on Open Fields." *The Journal of Economic History,* Vol 51, No 2 (June).

Meyers Grosses Konversations Lexicon Bd 7 (1905).

Mitchell, B.R. (1962), *Abstract of British Historical Statistics.* Cambridge University Press.

Modée, R.G. *Utdrag ur alla ifrån den 7 dec. 1718 utkomne publique handlingar, placater, förordningar, resolutioner och publicationer* I– XV 1742–1829. Stockholm.

Morell, Mats (1988), "Om Mått- och Viktsystemens utveckling i Sverige sedan 1500-talet." *Uppsala Papers in Economic History. Research Report No 16.* Uppsala.

Morell, Mats (1989), *Studier i den svenska livsmedelskonsumtionens historia.* Uppsala.

Morell & Whitacker (1992), *The productivity performance of the Agricultural sectors in Sweden and in the UK in the interwar years.* Paper. Uppsala.

Myrdal, Janken (1999), *Jordbruket under feodalismen.* Borås.

Myrdal, J. and Söderberg, J. (1991), *Kontinuitetens dynamik.* Stockholm

Naudé, W (1896), *Die Getreidehandelspolitik,* Erster Band. In *Acta Borussica.* Berlin.

Olsen, G. (1942–44), "Studier i Danmarks Kornavel og Kornhandelspolitik i Tiden 1610–1660" in *Historisk Tidskrift* (Denmark).

Olsson, Mats (2002), *Storgodsdrift.* Malmö

Olsson, Mats (2005), *Skatta dig lycklig.* Södertälje.

Palm, Lennart Andersson (1993), *Människor och skördar.* Lund.

Palm, Lennart Andersson (1997), *Gud bevare utsädet!* KSLA. Hållsta.

Pelc, J. (1937), *Ceny w Gdansku w XVI i XVII Wieku.* Lwow.

Perlinge, Anders (2005), *Sockenbankirerna.* Stockholm.

Pfister, Christian (1985*), Bevölkerung, Klima und Agrarmodernisierung 1525–1860. Das Klima der Schweiz von 1525–1860 und seine Bedeutung und Landwirtschaft.* Berne, vol 2, 2nd ed.

Pfister, Christian (1988), "Fluctuations Climatiques et prix cerealiers en Europe du XVIe au XXe siecle", *Annales ESC, janvier-fevrier 1988, no 1.*

Persson K.G. (1999), *Grain Markets in Europe, 1500-1900.*
Cambridge University Press.

Post, John (1985*), Food Shortage, Climatic variability and Epidemic Disease in Preindustrial Europe. The Mortality Peak of the Early 1740's.*
Cornell University Press.

Pred, Alan (1986) *Place, practice and structure.* Totowa, New Jersey.

Rahlf, Thomas (1996),
Getreide in der Sozial und Wirtschaftsgeschichte von 16. bis 18. Jahrhundert. Trier.

Rantanen, Marti (1997), *Tillväxt i periferin.* Göteborg.

Ricardo, David (1923), *Economic Essays.* G. Bell and Sons. London.

Riksdagshandlingar (RH) Bih till riksståndens prot. 1847–48 1.Saml. 1 Avd.2 Band.

Ross, Stephen A. Westerfield, Randolph W.and Jaffe, Jeffrey F. *Corporate Finance* (2002) McGraw Hill.

Salmonsens Konversations lexikon Bind IV (1916) Copenhagen.

Samuelson, Paul A. (1957)," Intertemporal Price Equilibrium: A Prologue to the Theory of Speculation". In *Weltwirtschaftliches Archiv 79.*

Sandström, Åke (1990), *Mellan Torneå och Amsterdam.* Borås.

Sen, A.K. (1981), *Poverty and Famines.* Clarendon Press. Oxford.

Skoglund, Anna-Maria (1992), *Fattigvården på den svenska landsbygden år 1829.*
Täby.

Slicher van Bath, B.H. (1963), "Yield Ratios, 1810–1820." *A.A.G. Bijdragen 10.* Wageningen.

Slicher van Bath, B.H. (1977), "Agriculture in the Vital Revolution", in *Cambridge Economic History of Europe 5.* Cambridge.

Smith, Adam. (1776), (1971), *The Wealth of Nations.* Everyman's Library. Dent London.

Soom, Arnold (1961), *Der Baltische Getreidehandel im 17. Jahrhundert* Stockholm.

Stiernman, von A.A. (1766), *Samling utaf Kongl Bref, Stadgar och Förordningar angående Sveriges Rikes Commerce, Politie och oekonomie.* Del 5. Stockholm.

Stigler, George (1954) "The early history of empirical studies of consumer behaviour" in *The Journal of Political Economy. Vol. XLII.*

Sundbärg, Gustav (1895) "Om produktionen och konsumtionen av våra vigtigaste sädesslag" i *Landtbruksakademiens handlingar och tidskrift.*

SCB (1955) *Historisk Statistik för Sverige* I. Stockholm.

SCB (1959) *Historisk Statistik för Sverige* II. Stockholm.

SCB (1972) *Historisk Statistik för Sverige* III. Stockholm.

Sveriges Riksbank 1668–1924 del V Bilagor, (1931), Stockholm.

Söderberg, Johan (1999), *Våld och civilisering i Sverige 1750–1870.* Andra uppl. Stockholm.

Teerijoki, Ilka (1987) "Sockenmagasinen i Nylands och Tavastehus län under den svenska tiden". *Historisk Tidskrift för Finland.*

Teerijoki, Ilka (1993), *Nälkävousien turva?* Helsinki.

Thorburn, Thomas (2000), *Economics of Transport: The Swedish Case 1780-1980.* Lund

Tielhof, Milja van (2002), *The Mother of all Trades.* Leiden.

Tiscornia, Alberto (1992), *Statens, godsens eller böndernas socknar?* Uppsala.

Utterström, Gustaf (1955), "Climatic Fluctuations and Population Problems in Early Modern History." *The Scandinavian Economic History Review III. No 1.*

Utterström, Gustaf (1957a), *Jordbrukets arbetare. Första delen.* Stockholm.

Utterström, Gustaf (1957b), *Jordbrukets arbetare. Andra delen.* Stockholm.

Wallerius, J.G. (1779), "Observationer vid åker-bruket, gjorda i 30 år." In *Kongl Vetenskapsakademiens handlingar. Vol 40.* Stockholm.

Weibull, Carl-Gustaf (1923), *Skånska jordbrukets historia.* Lund

Vries, Jan de, and Woude, Ad van der (1997), *The First Modern Economy.* Cambridge University Press.

Will, Pierre-Etienne, and Wong R. Bin Wong, (1991), *Nourish the people: the State Civilian Granary System in China 1650–1850.* Ann Arbor.

Wolontis, J. (1936), *Kopparmyntningen i Sverige 1624–1714.* Helsingfors.

Ågren, Kurt (1964), *Adelns bönder och kronans*, Uppsala.

Åmark, Karl (1915), *Spannmålshandel och spannmålspolitik i Sverige 1719–1830.* Stockholm.

Åmark, Karl (1921), "En svensk prishistorisk studie," in *Ekonomisk Tidskrift.*

Öhrman, Roger (1990), "Sockenmagasinen på Gotland" in *Gotländskt Arkiv* Vol 62.

Ögren, Anders (2003), *Empirical Studies in Money, Credit and Banking.* Stockholm.

EFI, The Economic Research Institute

Published in the language indicated by the title. A complete publication list can be found at *www.hhs.se/efi* Books and dissertations can be ordered from EFI via e-mail: EFI.Publications@hhs.se

Reports since 2002

2007

Books

Wijkström, Filip och Torbjörn Einarsson.
Analysmodell för sektorsöverskridande statistik. Fallet vård och omsorg.

Dissertations

Valiente, Pablo. *Re-innovating the Existing.*
A study of Wireless IS Capabilities to Support Mobile Workforces.

2006

Books

Thodenius, Björn. *Organisering av kunskap. En studie av Wallenberg Consortium North.*
Wijkström, Filip och Torbjörn Einarsson. *Från nationalstat till näringsliv?*
Det civila samhällets organisationsliv i förändring.
Wijkström, Filip, Einarsson, Stefan och Larsson, Ola. *Staten och det civila samhället*
Idétraditioner och tankemodeller i den statliga bidragsgivningen till ideella organisationer.
Östman, Lars. *Lysande ögonblick och finansiella kriser. Dramaten under ett sekel.*

Dissertations

Argenton, Cedric. *Quality provision in duopoly.*
Beckerman, Carina.
The Clinical Eye. Constructiong and Computerizing an Anesthesia Patient Record.
Borglund, Tommy.
Aktievärden i fokus – internationell påverkan på intressentrelationer vid förvärv och fusion.
Breman, Anna. *The Economics of altruism, paternalism and self-control.*
Edquist, Harald. *Technological breakthroughs and productivity growth.*
Eklund, Jana. *Essays on Forecasting and Bayesian Model Averaging.*
Frostenson, Magnus. *Legitimitetskontrollen –*
en studie av etiska värderingars roll i gränsöverskridande förvärv och fusioner.
Gaspar, Raquel M. Credit Risk and Forward Price Models.
Gustafsson, Peter. *Essays on Trade and Technological Change.*
Hopkins, Elisabeth. *Is a higher degree of local currency pricing associated with lower exchange rate pass-through? A study of import pricing in 51 Swedish industries.*
Kling, Ragnar. *Developing Product Development in Times of Brutal Change.*
Langenskiöld, Sophie. *Peer Influence on Smoking: Causation or Correlation?*
Lychnell, Lars-Olof. *"Och fungerar det inte, gör vi på något annat sätt" — En klinisk fallstudie av IT-relaterat förändringsarbete i småföretag.*

Meitz, Mika.
Five Contributions to Econometric Theory and the Econometrics of Ultra-High-Frequency Data.
Mendicino, Caterina.
Financial Market Imperfections, Business Cycle Fluctuations and Economic Growth.
Ovanfors, Anna. *Essays on Nonlinear Time Series Analysis and Health Economics.*
Paltseva, Elena. *Essays on Commitment and Inefficiency in Political Economy.*
Rogberg, Martin. *Den modeföljande organisationen. Om acceptansen av TQM och andra populära managementmodeller.*
Silvennoinen, Annastiina. *Essays on Autoregressive Conditional Heteroskedasticity.*
Sjögren, Ebba. *Reasonable Drugs. Making Decisions with Ambiguous Knowledge.*
Slinko, Irina. *Essays in Option Pricing and Interest Rate Models.*
Wilander, Fredrik. *Essays on Exchange Rates and Prices.*

2005

Books

Andersson, Per, Susanne Hertz and Susanne Sweet (eds).
Perspectives on market networks – boundaries and new connections.
Charpentier, Claes. *IT inom omsorgen.*
Förväntade effekter av införande av IT-system för utförarna inom äldre- och handikappomsorgen.
Dembrower, Maria. *Entreprenörskap i industriella nätverk.*
Lind, Johnny och Göran Nilsson (redaktörer).
Ekonomistyrningens metoder, sammanhang och utveckling – En vänbok till Lars A Samuelson.
Samuelson, Lars A.
Organizational governance and control – a summary of research in the Swedish society.
Svedberg Nilsson, Karin, Roger Henning och Karin Fernler (eds). *En illusion av frihet? Företag och organisationer i regelsamhället. EFIs Årsbok 2005. EFI/Studentlitteratur.*

Dissertations

Andersson, Martin. *Making a Difference – Project Result Improvement in Organizations.*
Arvidsson, Per.
Styrning med belöningssystem – Två fallstudier om effekter av belöningssystem som styrmedel.
Bems, Rudolfs. *Essays in International Macroeconomics.*
Berg-Suurwee, Ulrika.
Nya trender, nya nämnder – effekter av en stadsdelsnämndsreform inom kultur och fritid.
Björkman, Hans.
Learning from members – Tools for strategic positioning and service innovation in trade unions.
Bodnaruk, Andriy. *Essays in Empirical Corporate Finance and Portfolio Choice.*
Clapham, Eric. *Essays in Real Estate Finance.*
Dareblom, Jeanette. *Prat, politik och praktik –*
Om individers möten med strukturer i en kommunal satsning på kvinnors företagande.
Fromm, Jana. *Risk Denial and Neglect: Studies in Risk Perception.*
Hjelström, Anja. *Understanding International Accounting Standard Setting –*
A Case Study of IAS 12, Accounting for Deferred Tax.
Hortlund, Per. Studies on Swedish Banking 1870-2001.
Lindahl, Therese. *Strategic and Environmental Uncertainty in Social Dilemmas.*
Linnarsson, Håkan.
Alliance for Innovation. A structural perspective on new business development in cooperative ventures.

Madestam, Andreas. *Developing Credit Markets.*
Nilsson, Roland. *The Market Impact of Short-Sale Constraints.*
Nordfält, Jens. *Is consumer decision-making out of control?*
Non-conscious influences on the consumer decision-making process for fast moving consumer goods.
Nordin, Fredrik. *Externalising Services – Walking a Tightrope between Industrial and Service Logics.*
Parmler, Johan. *Essays in Empirical Asset Pricing.*
Simbanegavi, Witness. *Price Discrimination, Advertising and Competition.*
Thodenius, Björn.
Användning av ledningsinformationssystem: en longitudinell studie av svenska storföretag.
Tolis, Christofer. *Framing the Business – Business Modelling for Business Development.*
Östberg, Per. *Corporate Disclosure and Investor Recognition.*

2004

Books

Ahrne, Göran och Nils Brunsson (red). *Regelexplosionen.*
Lind, Johnny. *Strategi och ekonomistyrning.*
En studie av sambanden mellan koncernstrategi, affärsstrategi och ekonomistyrning.
Lind, Johnny och Walter Schuster (red).
Redovisningens teori, praktik och pedagogik. En vänbok till Lars Östman.
Sevón, Guje och Lennart Sjöberg (red). *Emotioner och värderingar i näringslivet. EFIs Årsbok 2004.*
Wijkström, Filip and Stefan Einarsson. *Foundations in Sweden – Their scope, roles and visions.*

Dissertations

Anderson, Anders. *Essays in Behavioral Finance.*
Balsvik, Gudrun. *Information Technology Users:*
Studies of Self-Efficacy and Creativity among Swedish Newspaper Journalists.
Blix, Magnus. *Essays in Mathematical Finance – Modelling the Futures Price.*
González Gómez, Andrés. *Nonlinear dynamics and smooth transition models.*
Grönqvist, Erik.
Selection and Moral Hazard in Health Insurance: Taking Contract Theory to the Data.
Ivarsson Westerberg, Anders.
Papperspolisen – varför ökar administrationen i moderna organisationer.
Jutterström, Mats. *Att påverka beslut – företag i EUs regelsättande.*
Jönsson, Kristian. *Macroeconomic Aspects of Capital Flows to Small Open Economies in Transition.*
Larsson, Pär. *Förändringens villkor. En studie av organisatoriskt lärande och förändring inom skolan.*
Lagerwall, Björn. *Empirical Studies of Portfolio Choice and Asset Prices.*
Malmsten, Hans. *Properties and Evaluation of Volatility Models.*
Marshall, Cassandra. *Dating for Innovation. Creating and Recognizing Opportunities*
through Collaborative Interorganizational Relationships in Fluid Environments.
Mattsson, Susanna.
På gränsen mellan ordning och oordning – tingens betydelse vid marknadsombildningar.
En studie av svenska postväsendets ombildning under 1990-talet.
Nilsson, Charlotte.
Studies in Environmental Economics: Numerical Analysis of Greenhouse Gas Policies.
Nilsson, Hans.
Medborgaren i styrsystemet – beskrivning av VAD och HUR i styrning av kommunal verksamhet.

Nystedt, Jens. *Competition, Regulation and Integration in International Financial Markets.*
Pajuste, Anete. *Corporate Governance and Controlling Shareholders.*
Richtnér, Anders. *Balancing Knowledge Creation.*
Organizational Slack and Knowledge Creation in Product Development.
Salabasis, Mickael.
Bayesian Time Series and Panel Models – Unit Roots, Dynamics and Random Effects.
Sandberg, Rickard. *Testing the Unit Root Hypothesis in Nonlinear Time Series and Panel Models.*
Skallsjö, Sven. *Essays on Term Structure and Monetary Policy.*
Strikholm, Birgit. *Essays on Nonlinear Time Series Modelling and Hypothesis Testing.*
Söderström, John.
Från Produkt till Tjänst. Utveckling av affärs- och miljöstrategier i produktorienterade företag.
Talia, Krim. *The Scandinavian Currency Union, 1873–1924 –*
Studies in Monetary Integration and Disintegration.

2003

Books

Lundahl, Mats (editor). *Globalization and Its Enemies. EFIs Årsbok 2003.*
Sundgren, Bo, Pär Mårtensson, Magnus Mähring and Kristina Nilsson (editors).
Exploring Patterns in Information Management.
Concepts and Perspectives for Understanding IT-Related Change.

Dissertations

Andersson, Henrik. *Valuation and Hedging of Long-Term Asset-Linked Contracts.*
Bergman, Malin. *Essays on Human Capital and Wage Formation.*
Damsgaard, Niclas. *Deregulation and Regulation of Electricity Markets.*
Eklund, Bruno. *Four Contributions to Statistical Inference in Econometrics.*
Hakkala, Katariina.
Essays on Restructuring and Production Decisions in Multi-Plant Firms.
Holgersson, Charlotte. *Rekrytering av företagsledare. En studie i homosocialitet.*
Ivaschenko, Iryna. *Essays on Corporate Risk, U.S. Business Cycles,*
International Spillovers of Stock Returns, and Dual Listing.
Lange, Fredrik.
Brand Choice in Goal-derived Categories – What are the Determinants?
Le Coq, Chloé. *Quantity Choices and Market Power in Electricity Market.*
Magnusson, Peter R. *Customer-Oriented Product Development –*
Experiments Involving Users in Service Innovation.
Meisiek, Stefan.
Beyond the Emotional Work Event Social Sharing of Emotion in Organizations.
Mårtensson, Anders. *Managing Mission-Critical IT in the Financial Industry.*
Nilsson, Göran. *Processorientering och styrning – Regler, mål eller värderingar?*
Sandberg, Robert.
Corporate Consulting for Customer Solutions Bridging Diverging Business Logics.

Sturluson, Jon Thor. *Topics in the Industrial Organization of Electricity Markets.*
Tillberg, Ulrika. *Ledarskap och samarbete – En jämförande fallstudie i tre skolor.*
Waldenström, Daniel. *Essays in Historical Finance.*
Wallén, Ulrika. *Effektivitet i grundskolan i anslutning till en stadsdelsnämndsreform.*
Ögren, Anders. *Empirical Studies in Money, Credit and Banking –*
The Swedish Credit Market in Transition under the Silver and the Gold Standards, 1834–1913.

2002

Books

Schuster, Walter. Företagets Valutarisk – *En studie av horisontella och vertikala styrprocesser.*
Sjöstrand, Sven-Erik och Pernilla Petrelius. *Rekrytering av koncernstyrelsen –*
Nomineringsförfaranden och styrelsesammansättning med fokus på kvinnors ställning och möjligheter.
EFI/SNS Förlag.
Löwstedt, Jan och Bengt Stymne (red). *Scener ur ett företag –*
Organiseringsteori för kunskapssamhället. EFIs Årsbok 2002. EFI/Studentlitteratur.

Dissertations

Barinaga, Ester.
Levelling Vagueness – A Study of Cultural Diversity in an International Project Group.
Berglund, Johan.
De otillräckliga – En studie av personalspecialisternas kamp för erkännande och status.
Bolander, Pernilla. *Anställningsbilder och rekryteringsbeslut.*
Damjanovic, Tatiana. *Essays in Public Finance.*
Ekman, Mattias. *Studies in Health Economics – Modelling and Data Analysis of Costs and Survival.*
Heyman, Fredrik. *Empirical Studies on Wages, Firm Performance and Job Turnover.*
Kallifatides, Markus. *Modern företagsledning och omoderna företagsledare.*
Kaplan, Michael.
Acquisition of Electronic Commerce Capability – The Cases of Compaq and Dell in Sweden.
Mähring, Magnus. *IT Project Governance.*
Nilsson, Mattias. *Essays in Empirical Corporate Finance and Governance.*
Schenkel, Andrew. *Communities of Practice or Communities of Discipline –*
Managing Deviations at the Øresund Bridge.
Skogsvik, Stina. *Redovisningsmått, värderelevans och informationseffektivitet.*
Sundén, David. *The Dynamics of Pension Reform.*
Ternström, Ingela.
The Management of Common-Pool Resources – Theoretical Essays and Empirical Evidence.
Tullberg, Jan. Reciprocitet – *Etiska normer och praktiskt samarbete.*
Westling, Gunnar. *Balancing Innovation and Control –*
The Role of Face-to-face Meetings in Complex Product Development Projects.
Viklund, Mattias. Risk Policy – *Trust, Risk Perception, and Attitudes.*
Vlachos, Jonas. *Risk Matters – Studies in Finance, Trade and Politics.*