The use of intangible assets as loan collateral

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Abstract

This dissertation investigates the role of intangibles in reducing financing frictions in credit markets and examines whether intangible collateralization is associated with risky lending in the corporate loan market by using a sample of secured syndicated loans. While the predominant managerial and scholarly perspective suggests that intangible assets are not eligible collateral, I find that twenty-one percent of U.S.-originated secured loans include intangible assets as loan collateral, and the collateralization of intangibles has significantly increased in the recent decade. I hypothesize and find that intangible redeployability and borrower reputation are positively related to the probability of using intangibles as loan collateral. I further hypothesize and find that collateralizing loans by intangibles significantly increases loan pricing and the supply of credit to firms. Moreover, loans secured by intangibles perform no worse to other secured loans. Finally, I triangulate these results using evidence from two field studies in a finance company and a private fund that collateralize and appraise trademarks and patents in liquidation. Overall, I provide evidence in favor of the hypothesis that intangible asset collateralization is an innovation in credit markets that alleviates financing frictions.

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To my beloved grandfather, George.

To my family.

Introduction

In this dissertation, I explore the role of intangible assets in reducing financing frictions in credit markets.[1] In the recent decades, firms have increasingly invested in intangibles to enhance their uniqueness and competitive advantage (Lev, 2001; Nakamura, 2001). However, higher dependence on intangibles distorts firms' ability to raise capital in credit markets, because low redeployability, higher information asymmetry and uncertain liquidation value inherent in intangibles restrict their effective use as loan collateral (Myers, 1977; Williamson, 1988; Shleifer and Vishny, 1992; Holthausen and Watts, 2001).

To address the imbalance between the supply and demand of eligible collateral, a new largely unregulated segment in the U.S. credit market using intangible assets as a form of collateral has developed. Using a sample of secured syndicated loans during 1996-2005, I find that twenty-one percent of secured syndicated loans have been collateralized by intangible assets, and this credit practice has grown from eleven percent of total secured loans in 1997 to twenty-four percent in 2005 (Figure 1).[2] While the use of intangible assets as loan collateral partially alleviates borrowing constraints, this credit practice emerged in a period of excessive credit

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[1] According to UCC Article 9, intangibles are defined as "any personal property other than goods, accounts, chattel paper, documents, instruments and money." This definition of intangibles includes separate, salable, discrete intangibles with well-defined property rights, thus intangible assets (capitalized and off-the-balance sheet, other than goodwill), such as patents, trademarks, copyrights, trade secrets, customer lists, domain names and proprietary designs, are considered as eligible collateral.

[2] This estimate is based on a sample of 1,415 secured syndicated loans with complete loan characteristics to U.S.-based public firms, for which DealScan LPC includes information on the assets used as collateral. These loans are not secured by all borrower assets (see "Sample Selection"). Also, I test for reporting bias of loan collateral in DealScan (see "Sample Selection"). Taking all syndicated loans (secured and unsecured) into consideration, the percentage of loans secured by intangible is 3 percent.

expansion and laxer credit standards,[3] raising questions about whether the collateralization of intangibles was an innovation or a negative mutation in the corporate loan market. Using this context, I investigate whether the collateralization of intangibles was associated with risky lending in the corporate loan market by examining the performance of loans secured by intangible assets and screening mechanisms used by lenders to alleviate adverse selection and moral hazard inherent in intangibles.

Several factors explain the rise and growth of this credit practice. First, higher intangible capital market liquidity and sophisticated methods of valuing intangible assets influenced lenders' decision to secure loans by intangibles, decreasing monitoring costs and information asymmetry inherent in these assets (e.g., Gu and Lev, 2004). Second, structural changes in the syndicated loan market were further related to the use of intangibles as loan collateral. Over the past several years, unregulated lenders (finance companies, insurance firms, investment banks, institutional investors) have become an important source of credit (e.g., Ivashina and Sun, 2009). These financial intermediaries adopted different and unconventional credit practices (e.g., Carey, Post and Sharpe,1998) and have been willing to lend to distressed borrowers by leveraging "residual" collateral (i.e. intangibles) that commercial banks had largely ignored. Overall, the interactions of recent developments in markets for intangibles and changes in credit markets created an opportunity for lenders to leverage borrowers' intangible assets that had been previously discounted in loan agreements.

To investigate how lenders collateralize, value and monitor borrowers' intangibles, I conducted two field studies in a private fund and a finance company that specialize in appraising

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[3] For example, "covenant lite" loans and "payment in kind" bonds (PIK) were popular credit practices used by creditors to offer cheap and more liquidity to borrowers during the recent credit boom.

Figure 1: Intangible collateralization, 1996-2005
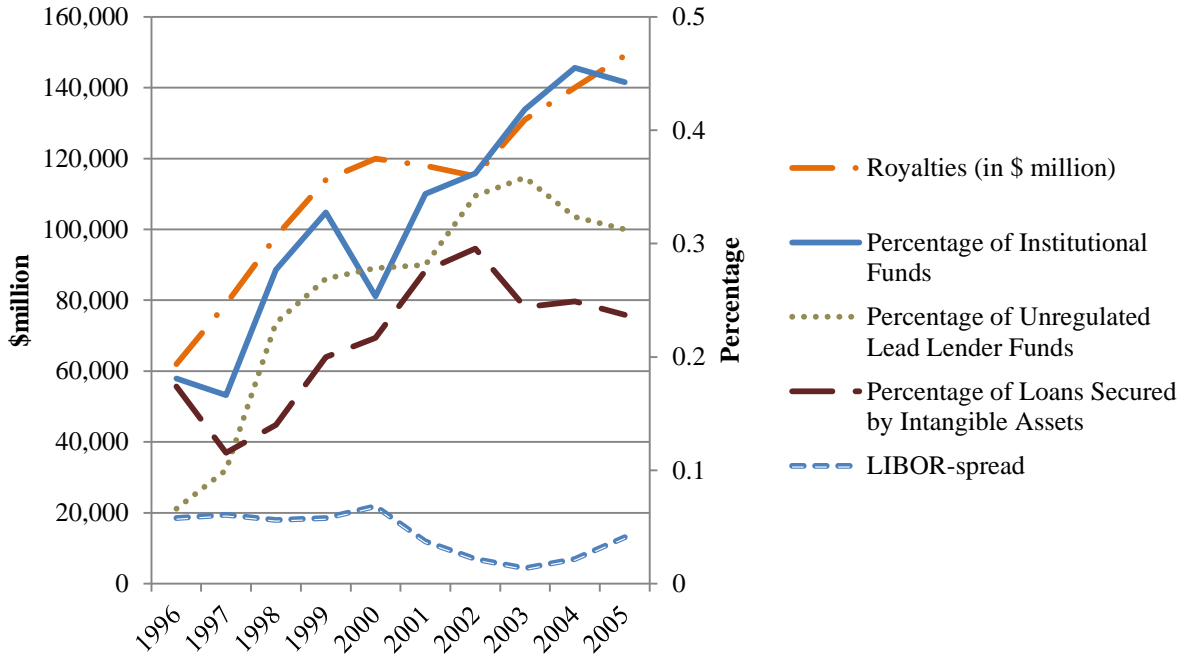
Figure 1: Intangible collateralization. This figure shows the use of intangible as loan collateral during 1996-2005, and the changes in credit and intangible asset markets. Royalties is the total size ($ million) of income from IP royalties and licensing fees as reported by IRS Statistics of income, "Returns of Active Corporations 1994–2005." LIBOR-spread is the average sixth month LIBOR-spread per year. Percentage of institutional funds is the ratio of the size of institutional loans (Term Loan B-H) divided by the size of total secured loans reported by DealScan. Percentage of unregulated lead lender is the ratio of the size of loans underwritten by unregulated lead lenders (finance companies, investment banks, insurance) divided by the size of total secured loans reported by DealScan. Percentage of loans secured by intangibles is the ratio of the size of loans that include intangible assets as collateral in a sample of 1,415 secured loans, divided by the size of total secured loans.

and collateralizing patents and trademarks. During my field visits, I interviewed the management teams and attended their internal meetings. Moreover, I had access to their portfolios of past valuation and collateralization cases. The findings show that loans secured by intangibles involve greater screening at the time of origination to mitigate adverse selection and moral hazard inherent in intangibles. Specifically, the use of intangibles as loan collateral is limited to separable and contractible intangibles of reputable borrowers with a long history of cash flows.

To mitigate conflicts of interest with less senior lenders upon borrower's bankruptcy, the collateral interest in intangibles is first-lien and usually includes all separable intangibles (for example, trademarks, customer lists, patents and/or copyrights related to a product brand or firm's operations), as well as tangible assets. However, over the last several years loans are also secured solely by intangibles.

I examine four hypotheses to test how economic considerations influence lenders' and borrowers' decision to use intangible assets as loan collateral. To the extent that the collateralization of intangibles is an innovation in the credit market, lenders are expected to develop screening and monitoring mechanisms to alleviate adverse selection and moral hazard in intangibles by selecting on borrower and intangible characteristics that mitigate these risks. Moreover, under the innovation hypothesis, lenders will extend credit on intangibles by demanding higher loan pricing as compensation for their due diligence and monitoring effort. Finally, to the extent that the collateralization of intangibles is associated with risky lending, I expect that loans secured by intangibles will perform worse than other secured loans.

My first hypothesis predicts which intangibles will be used as loan collateral. If such lending is valuable, I expect that liquid and redeployable intangible assets will be pledged as loan collateral. Information asymmetry and moral hazard inherent in intangible assets decrease when intangibles are actively traded and their value is determined by market prices. In addition, the liquidation value of redeployable and liquid intangible assets will not significantly deviate from the value in best use (Williamson, 1988; Shleifer and Vishny, 1992; Benmelech et al., 2005). However, to the extent that this credit practice is associated with risky lending, I expect that

lenders that engage in this credit practice will relax their screening standards in intangibles that qualify as eligible loan collateral.

The second hypothesis predicts that reputable borrowers will be able to pledge their intangible assets as loan collateral. Strong prior lending relationships facilitate the collection of proprietary "soft" information that alleviates moral hazard in intangibles and decrease lender's monitoring costs (Petersen and Rajan, 1994; Berger and Udell, 1995; Bharath et al., 2008). Moreover, the accumulation of "soft" information helps lenders design loan contracts tailored to relationship borrowers' characteristics (e.g., Berger and Udell, 1995). However, if the collateralization of intangibles is related to risky lending, lenders are likely to aggressively leverage "residual" collateral that other lenders heavily discounted in an effort to gain market share from their competitors, without primarily focusing on the underlying economics of intangible assets.

The third hypothesis predicts the effect of pledging intangibles as collateral on loan pricing and size. To the extent that the collateralization of intangibles is a credit market innovation, I expect that lenders will demand higher compensation for monitoring and conducting specialized due diligence on intangibles. While securing loans by specialized assets (for example, brands and patents) will rationally increase loan pricing as a signal of the underlying collateral quality, this relation will not hold if intangible collateralization is a negative mutation in credit markets. For example, over the past few years loan underpricing offered greater and cheaper liquidity to risky borrowers and allowed financial institutions to gain market share, giving rise to a broader credit boom (Pavlov and Wachter, 2009; Economic Report of the President, 2009; Ivashina and Sun, 2011). Indeed, Bernanke (2008) argued that "the boom in

subprime mortgage lending was only a part of a much broader credit boom characterized by an underpricing of risk, excessive leverage, and the creation of complex and opaque financial instruments that proved fragile under stress."

The fourth hypothesis examines the performance of loans secured by intangible assets. If the collateralization of intangibles is a negative mutation in credit markets, lenders are likely to use intangible assets as "boot" collateral to extend more credit to low quality borrowers that lack strong tangible asset base. In this context, the collateralization of intangibles is negatively related to ex-post loan performance. However, if the collateralization of intangibles is an innovation in credit markets, using opaque assets as collateral (i.e. intangibles) creates an incentive for lenders to effectively monitor loans by extending greater effort to collect proprietary and less verifiable information for borrowers (Rajan and Winton, 1995).

Using a sample of 1,415 secured syndicated loans during 1996-2005, I find evidence consistent with the hypothesis that the collateralization of intangible assets is a credit market innovation. Intangible asset redeployability and borrower reputation increase the probability of using intangible assets as loan collateral, suggesting that this credit practice is associated with upfront screening mechanisms. Using a structural equation model to control for simultaneity bias, I find that using intangibles as collateral increases loan size by approximately 18 percent and loan pricing by 74 basis points. For an average loan of $232 million and three years maturity, this represents approximately $4.1 million in interest expenses.[4] For an average firm with assets of $1.7 billion, the increase in loan size represents 3 percent of total assets. Finally, I

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[4] Increase in interest expense is the net present value of three annual payments using LIBOR as a discount rate. The average LIBOR rate is 4.9 percent per year during the sample period. The result suggests that the increase in loan pricing is economically significant. I further find that loans secured by intangibles perform no worse than other secured loans, thus the results altogether suggest that higher loan pricing compensates lenders for the screening and monitoring costs, and the underlying risk.

find that loans secured by intangibles are of similar quality to other secured loans, and collateralizing loans by intangibles does not predict future deterioration in loan performance. Overall, lenders that engage in intangible collateralization rationally develop screening and control mechanisms for alleviating financing risks inherent in intangibles, and loans secured by intangibles do not underperform other secured loans. The findings reject the negative mutation hypothesis and provide evidence consistent with the fact that adverse selection and moral hazard inherent in intangibles are not inevitably problematic in leveraging intangibles in credit markets.

There are several explanations for my findings. First, the syndication structure of loans secured by intangibles involves fewer co-syndicates (loan participants). In addition, the lender that originates the loan (the "lead lender") retains a greater fraction of the loan on its balance sheet. Thus, credit risk is not largely diversified away, providing strong incentives to lenders for screening and monitoring. Second, loans secured by intangibles are harder to securitize or trade in the secondary loan market due to higher proprietary information costs associated with the underlying collateral. Thus, credit risk cannot be easily transferred after loan origination.

The results have important academic and managerial implications. While prior studies have focused on the value of intangibles for shareholders (Amir and Lev, 1996; Aboody and Lev, 1998; Lev and Zarowin, 1999), I show that under certain conditions intangible assets can potentially further increase firm value in credit markets that are the largest capital provider (Armstrong, Guay and Weber, 2010). Moreover, I contribute to the literature on the use of intangible assets in loan contracts (Frankel et al., 2006; Skinner, 2008; Beatty, Weber and Yu, 2008), by showing that lenders' incentives to write contracts on intangibles are associated with increasing the supply of credit to firms. I inform the debate on reforming accounting and

disclosure practices related to intangibles (e.g., Skinner, 2008) by providing preliminary evidence that creditors have found ways of leveraging, financing and valuing intangible assets. Finally, the thesis provides evidence on the value of intangible assets in liquidation that remains widely unknown in the business community.[5]

The rest of the dissertation proceeds as follows. Section 1 presents background and examples on the use of intangible assets as collateral. Section 2 discusses the related literature and section 3 presents the hypothesis development. Section 4 discusses the data and the sample selection criteria. Section 5 outlines the research design and proxies. Section 6 presents the results. Section 7 discusses the robustness tests, and section 8 concludes.

1. Intangible assets as loan collateral: background and examples

Over the last several years, intangible assets have been increasingly used as collateral in the syndicated loan market. Twenty-one percent of secured loans in 1996-2005 were secured by intangibles, and this credit practice has grown from eleven percent of total secured loans in 1997 to twenty-four percent in 2005 (Figure 1).

Prior studies have provided several explanations for the growth of this credit practice (e.g., Edwards, 2001; Ellis and Jarboe, 2010). First, the consolidation of the U.S. banking industry in the late 1980s created an underserved demand for capital by medium-sized companies. With large financial institutions acquiring regional banks, lenders shifted their credit portfolios towards loans to large corporations with strong cash flows, eliminating their exposure to opaque and riskier firms that have different asset structure and higher liquidity constraints.

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[5] Source: PwC Survey on "One Valuation fits all?", 2008; "Collateral Salvage", CFO.com, June 2, 2005.

This market opportunity led unregulated financial intermediaries (finance companies, insurance firms, etc.) to aggressively enter the corporate loan market. These lenders applied different credit practices (e.g., relied more on firms' assets than cash flows) and undertook higher credit risk by lending to leveraged borrowers (Flannery, 1989; Carey, Post and Sharpe, 1998). Moreover, banking deregulation laws (e.g., The Gramm-Leach-Bliley Act, 1999) and the introduction of market-flex language in 1998 that allowed changes in loan pricing based on investor demand further accommodated the participation of unregulated financial institutions in the corporate loan market. In this context, unregulated lenders increased their participation in credit markets by leveraging high-yielding "residual" collateral (i.e., intangibles) that commercial banks had heavily discounted (Edwards, 2001).

Second, another explanation is the increase in market liquidity and investments in intangible assets. Indeed, Nakamura (2001) finds that U.S. companies invest over $1 trillion in intangible assets. As a result, in the recent decades companies have developed sophisticated mechanisms for measuring and monitoring the value of their intangible capital (Kaplan and Norton, 2004). Apart from creating firms' competitive advantage, intangible assets have become a significant source of income. Internal Revenue Service data on corporate income suggest that the annual growth rate of revenue from royalties for intellectual property rose by 11 percent during 1994-2005. Income from royalties signaled firm quality to investors and decreased information asymmetry inherent in intangibles (Gu and Lev, 2004) by improving lenders' monitoring of intangible capital. Overall, the interactions of recent developments in credit markets and changes in markets for intangibles created an opportunity for lenders to leverage borrowers' intangible assets that had been previously discounted in lending agreements.

To investigate how lenders collateralize and monitor borrowers' intangibles, I conducted two eight-week field studies in a private fund and a finance company that specialize in appraising and collateralizing patents and trademarks. The first site is a private fund (approximately $1 billion net worth) that has appraised and collateralized more than twenty-five patents associated with mature biotech products over the last twenty years. The second field site is a finance company with a long history of liquidating, selling, appraising and collateralizing tangible assets. Over the last twenty years, the finance company has expanded its services to cover intangible assets by appraising, selling and collateralizing trademarks of distressed or bankrupt companies. During my field visits, I interviewed the senior management teams and analysts, and in the second site I had access to internal meetings and negotiations with one of the top five U.S. lead syndicates that used trademarks as collateral for a large syndicated loan. Moreover, I had access to their portfolios of past valuation and collateralization cases. Finally, I conducted phone interviews with twenty-three intellectual property appraisers and bank managers that value, trade and acquire patents and trademarks in bankruptcy liquidations, and lend against intangibles.

My interviews with the managers of the fund and the finance company revealed that intangible assets are considered to have significant collateral value, sometimes greater than that of tangibles, and that these intangibles are related to mature products, i.e. products with a long history of cash flows. Specifically,

"We do not view intangible assets as low quality collateral (…) The value of these companies (i.e. borrowers) was driven by their brands before going in distress, and the value of intellectual property (i.e. brands) is not lost upon bankruptcy (…) These companies had once a

strong brand image and their trademarks generated enormous cash flows (…) Fashion changes, trends change (and) these brands are not appealing any longer (…) However, this does not mean that they worth nothing at all (…) We believe that finding the right bidders –suppliers, customers or competitors– maximizes the value you can get out of trademarks in a liquidation auction."

"When (company name) filed for bankruptcy, we estimated that the value of its trademark was $60 million (…) we acquired the trademark and we have been licensing it to third parties (…) and the trademark is still generating significant cash flows."

"(Collateralizing patents) is an important source of capital for intangibles-intense companies (…) we lend against royalties from mature, established patents (…) companies can use the money to innovate and invest in developing new patents."

"(For example) when General Motors went out in the market for a syndicated loan, plants and inventory were worth nothing (…) the most important asset (that appraisers identified) was Opel patents, and General Motors used these patents as collateral. (Moreover,) in 2003 Levis Strauss completed a $500 million trademark-backed term loan."

"In earlier years, intangibles served as "boot" collateral (…) deals were secured by inventory or other "hard" assets and then lenders added intellectual property (…) over the last several years, banks frequently lend only against intangibles."

Moreover, lenders carefully screen borrowers that use their intangible assets as collateral. Specifically, valuation consultants described that "the initial screening and due diligence – sometimes before we even start our negotiations with the company- is the most important element for the deal to succeed. In most collateralization cases that failed, lenders had not

identified the right intangibles that could be pledged as collateral or did not accurately forecasted future sales associated with these assets. (Thus,) our competitive edge merely relies on this first step." As representatives from the credit divisions also highlighted, "lending against intellectual property is a "niche" market, and few borrowers have trademarks or patents that are eligible to collateralize (…) Few lenders have capabilities to collateralize loans by intangibles, identify and appraise intangibles in liquidation. (Also,) only a few companies are aware of this opportunity to leverage the value of their intangibles. We search for firms that have intangibles with certain characteristics, (as well as) for companies that are interested in raising debt or meet our standards and we then make them an offer for a loan."

The due diligence for collateralizing and appraising intangible assets includes three steps: assessing borrower quality, evaluating the quality of intangibles and estimating intangibles orderly liquidation value. In my interviews, all the appraisers and valuation analysts suggested that they use the "relief from royalties" approach in estimating the liquidation value of intangibles. According to this method, lenders assess future cash flows that intangibles are likely to generate. In addition, the valuation model assumes that intangible assets are not separable (for example, trademarks, patents and/or copyrights that support a product brand or firm's operations), thus the definition of collateral includes all assets in borrower's intellectual property portfolio ("assignment in gross"). Also, the field observations suggest that appraisers follow a highly conservative approach in valuing intangibles upon liquidation. For example,

"The first thing we do is assessing (firm's) operating performance: we look at operating income, sales, the variance in sales over the last several years, royalties, (…) goodwill impairments. Then, we identify (company's stakeholders, such as) major competitors, suppliers,

customers and vendors. This is a very important step, as we try to identify companies that are likely to buy the intellectual property or how many bids the intangibles are likely to attract in a forced sales liquidation (…) We then conduct field visits to major national and local retailers to evaluate the competitive positioning of the intangibles (…) Upon borrower bankruptcy, we apply a revenue reduction of 60 to 90 percent. (More specifically,) we assume a decline in sales because the company will cease operations for a certain period that liquidators will try to reorganize or sell the company. Usually, we assume a four to five month reorganization or liquidation period that will reduce sales by 44 percent. Also, we assume that the bankrupt company will lose some customers, but some key customers with binding contracts will be still interested in buying products associated with the brand or patent (...) We assume that after the year that the company files for bankruptcy the sales associated with the intellectual property will increase and will reach the growth rates forecasted (…) The growth rate of terminal value is around 0 to 3 percent."

"The next step is applying a licensing rate on the sales related to the intellectual property that will be liquidated. Generally, we take the company's industry average, adjusting for prior company's licensing agreements. For example, if the industry average is 7 percent and the company typically used a licensing rate of 10 percent in its past agreements, we will take the average of the two agreements, placing more weight on the industry's average rate. However, if the company used a licensing rate of 6 percent in its past agreements, we will also use 6 percent in our valuation model. Apart from the industry's average, we also take the licensing rates of other comparable companies into consideration. For example, if a company is in the retail industry and we assess that borrower's operations and brand positioning are similar to companies in other industries, such as entertainment, we will also adjust the licensing rates in our valuation

model (…) We also apply this methodology to companies whose intangibles are not licensed, as we believe that the economic benefit of purchasing the intellectual property will equal the average licensing rate (…) we update our estimates periodically."

"Then, we estimate a significant reduction in intangible value, by applying a higher discount rate (i.e. the yield that lenders lend against intangibles), approximately 60 to70 percent (...) we use the capital asset pricing model, and we assume a company premium and an extra premium (i.e., adjusted premium) for the excessive risk associated with collateralizing intangibles (i.e., usually 40 percent) (…) We also assume that a financial buyer will use both debt and equity to finance the transaction, and we use the credit market average as cost of debt. The loan to value ratio for intangibles is usually 20 to 30 percent (…) The discount rate will typically be higher if future intangible value is mainly driven from international cash flows (i.e., sales outside the US)."

"If I estimate that the useful life of the patent is 20 years, I will only lend against short-term cash flows generated in the next 3-4 years (…) I will (usually) lend 20 to 30 percent of the value, but this varies across patents and borrowers."

"We do not look at accounting standards for intellectual property, and accounting is by and large irrelevant to our lending decisions and the valuation model. (First,) accounting uses the historic cost approach which is not useful for us, as we try to come up with a fair value assessment for intangibles. (Thus,) capitalizing intangibles does not mean that we can reliably estimate their liquidation value. (Second,) we are primarily interested in the value of intangibles and whether we think purchasers of intangibles can retrieve some value if we have to liquidate

these assets (…) when we select on companies that could pledge their intangibles as collateral, capitalized and off-the-balance sheet intangibles are treated similarly."

Overall, the results of my field research suggest that lenders effectively alleviate adverse selection and moral hazard inherent in intangibles. A potential explanation for these findings is that the arranger of loans secured by intangibles holds a larger fraction of the loan on its balance sheet. In addition, the syndicate structure of loans secured by intangibles involves fewer co-syndicates (loan participants). Another explanation is related to the fact that loans secured by intangibles are not largely securitized (see also Figure 1) or traded in the secondary loan market due to higher proprietary costs associated with the underlying collateral, preventing lenders from transferring credit risk. Therefore, loans secured by intangibles involve greater screening at the time of origination from financial institutions that undertake higher nontransferable credit risk.

2. Literature review

The literature on the role of intangibles in reducing financing frictions in credit markets is scarce and has mostly explored legal issues on the use of intangibles as credit collateral (Bezant, 2003; Brian, 2011). Also, industry reports on intangible collateralization have focused on describing the terms and features of these transactions and the role of different stakeholders (Edwards, 2001; Eisbruck, 2002; Dorris, 2003; Watanabe, 2004).

An emerging literature examines the role of intangibles in signaling timely loan repayments. Frankel et al. (2007) suggest that the use of tangible net worth covenants decreases with borrowers' goodwill. Beatty, Weber and Yu (2008) investigate the determinants of excluding intangible assets from net worth covenants, arguing that goodwill amortization makes

net worth covenants more conservative. While evidence from these studies indicates that intangible assets are not ignored by debt holders, prior studies have been inconclusive on lenders' incentives to write contracts on intangibles (Beatty, Weber and Yu, 2008; Skinner, 2008). In this dissertation, I inform this literature by providing evidence of conditions when lenders use intangible assets as loan collateral to alleviate financing frictions.

Collateral is an important mechanism for decreasing credit rationing and credibly signaling a firm's quality (Stiglitz and Weiss, 1981; Sharpe, 1990; Boot and Thakor, 1994; Rajan and Winton, 1995). The ability to pledge collateral affects firm's investment strategy and future growth (Kiyotaki and Moore, 1997). Indeed, Gan (2007) finds that firms are less likely to raise debt after an exogenous decrease in the collateral value of their assets. Moreover, Benmelech and Bergman (2009) suggest that collateral redeployability affects cost of debt. Finally, Chaney et al. (2010) explore the effect of shocks to the value of real estate on aggregate investment, and find that U.S. corporations invest 6 cents out of each additional dollar of collateral. I contribute to this literature by exploring the use of a new asset class as eligible collateral. Also, while prior studies have widely explored the relation between the supply of credit and the liquidation risk of assets pledged as loan collateral (e.g., Benmelech et al., 2005), intangible assets differ in that their liquidation value depends on management quality, i.e. the terminal value of intangibles is highly related to managers' decisions.

Earlier research has investigated the determinants of loan collateralization. Past studies that explored the effect of lending relationships on the demand for collateral have been inconclusive. Borrowers with strong lending relationships are less likely to pledge collateral (Berger and Udell, 1992; Berger and Udell, 1995; Petersen and Rajan, 1994; Cole, 1998; Bharath

et al., 2008). However, Sharpe (1990) and Rajan (1992) suggest that relationship lenders will demand more collateral to "lock-in" borrowers and increase switching costs to competitors. Other factors that affect the probability of pledging collateral include borrower riskiness, loan size and loan maturity (Berger and Udell, 1992; Boot, Thakor and Udell, 1991; Dennis, Nanda and Sharpe, 2000). Finally, adverse selection and moral hazard models predict the effect of borrower quality on the probability of pledging collateral. Adverse selection suggests that higher quality borrowers use collateral to signal their quality to lenders (Bester, 1985; Besanko and Thakor, 1987), whereas models on moral hazard predict that collateral restricts future asset-substitution, implying that low quality borrowers will pledge their assets as collateral (Boot and Thakor, 1994). In this thesis, I explore the effect of borrower reputation on using specialized firm-specific assets as collateral.

3. Hypothesis development

I examine four hypotheses on economic considerations predicted to affect lenders' and borrowers' decisions to use intangible assets as loan collateral. To the extent that the collateralization of intangibles is a credit market innovation, I expect that lenders will develop screening and monitoring mechanisms, by selecting on borrower and intangibles characteristics that alleviate adverse selection and moral hazard in intangibles. Moreover, under the credit innovation hypothesis lenders will demand higher compensation to extend credit secured by intangibles. Finally, to the extent that the collateralization of intangibles is associated with risky lending, this credit practice will predict ex-post loan performance.

3.1.Determinants of the collateralization of intangible assets

The first hypothesis predicts which intangible assets are pledged as loan collateral. Under the credit innovation hypothesis, I expect that redeployable and liquid intangible assets will be used as loan collateral. Information asymmetry and moral hazard inherent in intangible assets decrease when intangibles are actively traded and their value is determined by market prices. In addition, the liquidation value of redeployable and liquid intangible assets will not significantly deviate from the value in best use (Williamson, 1988; Shleifer and Vishny, 1992; Benmelech et al., 2005). However, the use of intangible assets as collateral is likely to be a negative mutation in credit markets if lenders' standards for screening of qualifying intangibles are lax. Hence, to the extent that the collateralization of intangibles is an innovation in credit markets, my first hypothesis is:

H1: Intangible asset liquidity and redeployability is positively related to the probability of pledging intangibles as loan collateral.

The second hypothesis predicts that reputable borrowers will be able to pledge their intangible assets as loan collateral. Strong prior lending relationships facilitate the collection of proprietary "soft" information that will alleviate moral hazard in intangibles and decrease lender's monitoring costs (Petersen and Rajan, 1994; Berger and Udell, 1995; Bharath et al., 2008). Moreover, the accumulation of "soft" information helps lenders design loan contracts tailored to relationship borrowers' characteristics (e.g., Berger and Udell, 1995). However, if this credit practice is a negative mutation, lenders are likely to accept intangible assets as collateral in an effort to increase their market share in the corporate loan market by leveraging "residual" collateral that other lenders heavily discounted. Thus, under this hypothesis, the collateralization

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of intangibles is driven by competitive pressures rather than thoughtful economic considerations. Hence, to the extent that the collateralization of intangibles is a credit innovation, my second hypothesis is:

H2: Borrower reputation is positively related to the probability of pledging intangibles as loan collateral.

3.2. The collateralization of intangible assets, loan pricing and credit availability

The third hypothesis predicts the effect of pledging intangibles as collateral on loan pricing and size. To the extent that the collateralization of intangibles is an innovation in credit markets, I expect that lenders will be willing to extend credit against intangibles by demanding higher compensation to thoroughly screen and monitor more opaque collateral. While securing loans by specialized collateral with uncertain liquidation value (i.e. intangibles) will rationally increase loan pricing to signal the underlying quality, this relation might not hold if lenders' decision to extend credit on intangibles is not primarily driven by economic considerations. Over the last several years, the underpricing of risk increased the supply of credit to distressed borrowers and offered financial institutions the opportunity to gain market share, giving rise to a broader credit boom (Pavlov and Wachter, 2009; Economic Report of the President, 2009; Ivashina and Sun, 2011). Hence, to the extent that the collateralization of intangibles is an innovation, my third hypothesis is:

H3: The collateralization of intangibles increases loan pricing and size, ceteris paribus.

3.3. The collateralization of intangible assets and loan performance

The fourth hypothesis predicts the performance of loans secured by intangible assets. I expect that loans collateralized by intangibles are worse or better quality than other secured loans. Lenders are likely to soften credit standards and use "residual" assets as collateral to extend credit to riskier borrowers that lack sufficient tangible asset base (i.e., better quality collateral). However, collateralizing loans by opaque assets (i.e. intangibles) increases lenders' incentive to monitor loans (Rajan and Winton, 1995), by extending greater effort to collect proprietary and less verifiable information for borrowers. Moreover, higher quality borrowers are likely to engage in actions that are costly for poor quality firms to imitate (Spence, 1985; Ross, 1977), thus borrowers will pledge specialized and valuable assets (i.e. intangibles) as collateral to signal their value and reputation (Bester, 1985; Besanko and Thakor, 1987). Hence, to the extent that the collateralization of intangibles is a credit innovation, my fourth hypothesis is:

H4: Loans secured by intangible assets are better quality than other secured corporate loans.

4. Sample selection

I obtain my primary sample of secured syndicated loans from Reuters Loan Pricing Corporation DealScan, which includes details on loan terms, borrower and lender characteristics. DealScan extracts information from SEC filings (13Ds, 14Ds, 13Es, 10Ks, 10Qs, 8Ks and registration statements) and financial institutions, and covers 50 percent to 75 percent of all syndicated loans (Carey and Hrycay, 1999). DealScan includes 16,671 secured tranches (facilities) organized in 10,202 loans (packages) to 6,504 U.S.-based and international borrowers in the period 1988-2005. Because collateral is determined on the loan level, I use the loan as the unit of analysis.

To construct my sample of secured loans, I eliminate 4,730 loans (7,402 tranches) with missing information on the assets pledged as collateral. Moreover, I exclude 1,376 international loans (2,459 tranches) and 1,893 overcollateralized loans (2,681 tranches).[6] I obtain information on borrowers' financials by matching DealScan with the Compustat database, which restricts my sample to 1,492 loans (2,877 tranches). Finally, I eliminate years and industries (2-digit SIC) with fewer than ten loans, and loans to financial intermediaries (banks and trading companies). My final sample includes 1,415 secured loans (2,642 tranches) to 1,208 unique companies from 43 unique lead lenders. The sample selection process is summarized in Table 1.

Table 1: Sample selection

	Packages		Facilities
Secured loans in DealScan (1988-2005)	10,202		16,671
Less:			
Loans where collateral is unknown	*4,730*	*7,402*	
International loans	*1,376*	*2,459*	
Overcollateralized loans	*1,893*	*2,681*	
Loans to private firms	*711*	*1,252*	
Loans to industries (2-digit SIC) with fewer than fifteen loans/ Loans to banks	*77*	*235*	
Total	**1,415**		**2,642**

Table 1: Sample selection. The table provides information on the procedures employed to identify a sample of U.S.-originated loans on the DealScan database with complete contract terms to U.S.-based public firms.

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[6] In overcollateralized loans where lenders seize all borrowers' assets, lenders use the term "intangible assets" as a "floating charge" rate to gain exclusive rights to reorganize or liquidate firms (Djankov et al., 2008; Gennaioli and Rossi, 2010). In this context, the term "intangibles" is not related to intangible capital screening at the time of loan origination and does not directly affect the loan to value ratio. My interviews with Russell Parr, an expert in intangibles valuation, confirm this finding. Also, industry experts (e.g., Ellis and Jarboe, 2010) suggest that "intangibles have always been included in a blanket lien on all assets. In these cases, the IA is not explicitly identified or incorporated into the terms of the loan. Thus, the collateral value of the assets is not recognized and the borrower may not receive all of the capital they could qualify for."

Assets pledged as collateral are categorized in accounts receivable, inventory, agency guaranty, cash and marketable securities, ownership of options, intangible assets, real estate, and property, plants and equipment (PPE). To correct for bias in DealScan reporting of loan collateral, I collect firms' 8-K filings in EDGAR database that disclose the contracts of the loans in my sample. I identify 74 loans where assets pledged as collateral are misreported in DealScan, and 9 loans where the term "intangibles" is used instead of receivables. The final sample includes 361 loans collateralized by intangible assets (26 percent of my sample) to 343 unique borrowers from 37 unique lead lenders. Loans secured solely by tangibles are secured by inventories and accounts receivable (27 percent), PPE (68 percent) and cash (22 percent). Loans secured by intangible assets are further secured by inventories and accounts receivable (67 percent), PPE (42 percent) and cash (17 percent), thus intangible assets are used as additional collateral. Four percent of the firms in my sample have taken loans secured by tangibles and loans secured by tangibles and intangibles during 1996-2005. Borrowers in the apparel, hotel, computer and telecommunication industry are likely to leverage their intangibles in loan agreements (Table 2). There are 10,648 patents, 2,199 copyrights and 1,952 trademarks in my sample that borrowers used as collateral. Abstracts from syndicated loan contracts secured by intangibles are reported in appendix B.

Table 2: Intangible collateralization by industry

Industry	Number of secured loans	Percentage of loans secured by intangibles
Apparel	22	62%
Restaraunts, Hotels, Motels	50	36%
Communication	50	29%
Computers	22	28%
Personal services	29	25%
Retail	136	24%
Consumer goods	54	22%
Automobiles and Trucks	25	16%

Table 2: Intangible collateralization by industry. This table provides information on the intensity of using intangibles as loan collateral by industry (Fama-French 48 industry classification).

5. Research design and proxies

5.1. Determinants of intangible collateralization

The first two hypotheses predict the relation between intangible and borrower characteristics and the probability of pledging intangibles as collateral. To test the hypotheses (H1 and H2), I estimate a maximum likelihood (probit) model where the dependent variable is a binary variable that equals one if a loan includes intangible assets as collateral, and zero if a loan is secured only by tangibles (*Collateral_Intangibles*).

Probability (*Collateral_Intangibles* $_i$= 1)= α +β$_1$ *Intangible_Liquidity$_{i,t}$* +β$_2$ *Intangible_Redeployability$_{i,t}$* +β$_3$ *Lending_Relationship$_{i,t}$* +*Controls$_{i,t}$*

I use the following proxies for intangible liquidity and redeployability based on Shleifer and Vishny (1992): *Intangible_Liquidity* is defined as a binary variable that equals one if the firm licenses its intangible assets to third parties, and zero otherwise. Data on third party licenses of intellectual property are from borrowers' 10-K filings at the year of loan origination. I employ two proxies for *Intangible_Redeployability*: *Customers* is the number of borrower's key customers extracted from 10-K filings and the Capital IQ database. *Indirect_Competitors* is defined as the natural logarithm of the number of firms that are classified in borrower's secondary but not primary industry (2-digit SIC), using Compustat Segment Reports. These proxies are related to the likelihood that lenders successfully sell or liquidate borrowers' intangibles upon bankruptcy. For example, the customers of a firm are likely to acquire its patents or trademarks so that they can continue commercializing or using the products associated with these intangibles. Similarly, a firm's indirect competitors are likely to purchase its intangible assets upon bankruptcy so that they can improve their operational efficiency and/ or competitive advantage.[7]

The proxies for lending relationships are defined as follows: The strength of prior lending relationships (*Lending_Relationships)* is the size of syndicated loans that a borrower raised from a lead lender in the five years prior to loan origination, deflated by the total loan size raised in this period (Bharath et al., 2008). *Distance* is the natural logarithm of the distance (in miles) between the capital cities of the states where borrower's and lead lender's headquarters are located (Agarwal and Hauwald, 2010). Both variables proxy for lender's ability to collect "soft"

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[7] While a firm's direct competitors are more likely to acquire and easily redeploy its intangible assets, the value of intangibles is likely to depreciate faster under strong competitive pressures, thus the firm will have to invest more in intangibles to sustain their value. As a result, the number of direct competitors would be a noisy proxy for intangible redeployability.

proprietary information for valuing borrowers' intangible assets and alleviating moral hazard inherent in these assets.

I control for transaction costs of using risky collateral. Banks face regulatory constraints on the quality of collateral used in secured lending (e.g., FDIC Risk Management Manual for Secured Lending, 2011). While commercial banks are the dominant players in the syndicated loan market, unregulated lenders, including investment banks and finance companies, have entered the leveraged loan market (S&P Report on U.S. Syndicated Loan Market, September 2010) by engaging in different strategies to compete with commercial banks. For example, finance companies focus on opaque distressed firms, rely on borrowers' assets as a source of repayment and closely monitor collateral (Carey, Post and Sharpe, 1998). In addition, over the past few years, institutional investors with greater risk appetite have participated in syndicated loans and acted as "lenders of last resort" for distressed firms (S&P Report on U.S. Syndicated Loan Market, September 2010). I use 8-K filings and lender data on DealScan to create two proxies for transaction costs: *Unregulated_Lead* is defined as a binary variable that equals one if the lead lender is a finance firm, investment bank or insurance firm, and zero otherwise, and *Institutional* is a binary variable that equals one if the loan includes tranches sold to institutional investors (Term Loan B-H), and zero otherwise (Ivashina and Sun, 2011).

I control for the value of borrower's intangible assets using the following proxies: i) intangible asset intensity (*Intangibles*), defined as other intangibles, R&D and advertising expenses, deflated by total assets, ii) market to book value (*Market-to-Book*), defined as market value to book value of equity, iii) number of patents (*Patents*), defined as the natural logarithm of borrower's patents at the time of loan origination (NBER Database for Patents and Patent

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Citations, 2006), iv) number of trademarks and copyrights (*Trademarks_Copyrights*), defined as the natural logarithm of the number of active registered trademarks and copyrights at the time of loan origination (USPTO TESS Database and U.S. Copyright Office), v) G-Index (*G-Index*), defined in Gompers et al. (2003). While prior studies have shown that G-Index is related to the value of a firm, the value of specialized firm-specific assets (i.e. intangibles) is highly correlated to firm value, and as a result managerial decisions and characteristics that increase firm value will further increase the value of specialized assets. Thus, G-Index is an appropriate proxy for the value of borrowers' intangible assets.

Controls for borrower characteristics include: i) leverage (*Leverage*), defined as total debt to equity, ii) liquidity (*Liquidity*), defined as current assets to current liabilities, iii) capital assets (*Capital Assets*), defined as property, plant and equipment to total assets, iv) return on assets (*ROA*), defined as operating income to total assets, v) Herfindahl Index (*Herf_Index*), defined as firm's sales to industry sales (2-digit SIC), vi) credit rating (*Rated*), defined as a binary variable that equals one if the borrower is rated by S&P or Moody's, and zero otherwise, vii) z-score (*Z_Score_beg.*), defined as borrower's Altman z-score at the time of loan origination, vii) size (*Size*), defined as the natural logarithm of total assets. I include industry (2-digit SIC), year, lead lender and loan purpose (restructuring, refinancing and working capital/corporate purposes) fixed effects to control for persistent effects across industries, years, lenders and loan types.

Finally, I control for the following loan characteristics: i) loan amount (*Loan_Size*), defined as the natural logarithm of loan amount (in $million), ii) maturity (*Maturity*), defined as the natural logarithm of loan maturity (in months), iii) financial covenants (*Fin_Covenant*), defined as a binary variable that equals one if the loan includes a financial or (tangible) net worth

covenant, and zero otherwise, iv) number of co-syndicates (*Syndicates*), and v) performance pricing (*Perfprice*), defined as a binary variable that equals one if the loan includes a performance pricing provision, and zero otherwise.

5.2. The collateralization of intangible assets, loan pricing and credit availability

The third hypothesis predicts the effect of collateralizing loans by intangible assets on loan pricing and size. Because the decision to use intangibles as collateral, loan pricing and loan size are simultaneously determined, ordinary least squares estimates will be biased. Based on prior studies (e.g., Asquith, Beatty and Weber, 2005; Wittenberg-Moerman, 2008), I jointly model the collateral choice, loan pricing and loan size to eliminate simultaneity bias, by estimating two simultaneous equations models of loan size and collateral and loan price and collateral.[8]

Probability(Collateral_Intangibles)= α +β₁ Intangible_Liquidity$_{i,t}$ +β₂ Customers$_{i,t}$

+β₃ LIBOR-spread$_i$ +Controls

LIBOR-spread$_i$= α +β₁ Competitors$_{i,t}$ + β₂ Collateral_Intangibles$_i$ +Controls

Probability(Collateral_Intangibles)= α +β₁ Intangible_Liquidity$_{i,t}$ +β₂ Customers$_{i,t}$

+ β₃ Loan_Size$_i$ +Controls

Loan_Size$_i$= α + β₁ Goodwill$_{i,t}$ + β₂ Collateral_Intangibles$_i$ +Controls

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[8] I do not jointly determine loan size and loan pricing, because a firm's demand for capital determines the loan pricing, not vice versa (see also Ivashina, 2009). Thus, in my sample, the loan size will affect loan pricing through the choice of the underlying collateral.

I use several instruments for the endogenous variables.[9] Specifically, I use *Intangible_Liquidity* and *Customers* as instruments for the probability of collateralizing a loan by intangibles, because these proxies are unrelated to loan size and pricing, but affect the probability of using intangibles as collateral. I use *Goodwill* (defined as goodwill to total assets) as an instrument for loan size, because companies with greater future growth options are likely to take larger loans. However, goodwill is not pledged as collateral, thus it does not affect the probability of using intangibles as loan collateral. Finally, I use the natural logarithm of the number of companies with the same 2-digit SIC (*Competitors*) as an instrument for *LIBOR-spread* (the coupon spread over LIBOR on the drawn amount plus the annual fee), because competitive pressures increase firm's risk, and thus loan pricing, but are not directly associated with the probability of pledging intangibles as collateral (see also footnote 5).[10]

I control for the following borrower and loan characteristics: i) lending relationships, ii) distance between lead lender's and borrower's headquarters, iii) loan characteristics (unregulated lead lender, institutional loan, an indicator whether the loan includes a performance pricing provision, financial covenants, number of co-syndicates, loan maturity), and vi) other borrower characteristics (capital assets, leverage, liquidity, ROA, size, credit rating).

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[9] F-tests for instrument relevance show that my instruments are valid (untabulated). Moreover, I test and find that my instruments are not related to the other endogenous variables in my sample (untabulated).

[10] Because one of the endogenous variables is a binary variable, I follow Maddala (1983) to obtain consistent estimates for the coefficients and corrected standard errors.

5.3. The collateralization of intangible assets and loan performance

The fourth hypothesis predicts a relation between collateralizing loans by intangible assets and loan performance. To test my fourth hypothesis (H4), I estimate an ordinary least squares model where the dependent variable is loan performance over the life of the loan:[11]

$Loan\ Performance_{i,t=1-m} = \alpha + \beta_1\ Collateral\_Intangibles_i + Borrower\ Characteristics_{i,t} + Loan\ Characteristics_i + Controls_{i,t}$

I use several proxies for loan performance based on prior literature (Benmelech et al, 2011). First, I use the number of credit rating downgrades from S&P and Moody's over the life of the loan (*Credit_Downgrades*), adjusted to loan maturity. Data on credit ratings are extracted from the MDRS and Compustat database. All secured loans in my sample are senior first-lien, thus they have similar priority in repayment, making ratings an appropriate measure of loan performance. Second, I use the number of covenant violations (*Covenant_Violations*) over the life of the loan from Nini, Smith and Sufi (2009), adjusted to loan maturity.[12] While covenant violations are associated with total debt outstanding, violations are an appropriate measure of loan performance, as they trigger credit downgrades and are related to borrower's overall credit quality. Finally, I use the number of years that borrower's z-score (*Z-Score*) fell below 0.3 (i.e., the average z-score in the lowest two deciles during 1996-2010), adjusted to loan maturity.

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[11] Because my sample of loans ends in 2005, I observe loan performance from origination to maturity date. Six percent of the loans mature in 2011, two percent in 2012 and one percent in 2013, thus I expect bias from right-censoring to be insignificant.

[12] Because covenant violations in Nini, Smith and Sufi (2009) are quarterly reported, I define that a company violated debt covenants, if at least one covenant violation is reported in a given year. I eliminate loans with no financial or net worth covenant to companies that do not report covenant violations.

While z-score is an indirect measure of loan performance, it is based on accounting information and can be estimated for all borrowers in my sample.

Furthermore, I use a maximum likelihood (probit) model where the dependent variable is: i) an indicator that equals one if borrower's credit rating was downgraded over the life of the loan, and zero otherwise (*Credit_Downgrades2*), ii) a binary variable that equals one if the borrower violated at least one financial covenant over the life of the loan, and zero otherwise (*Covenant_Violations2*), iii) an indicator that equals one if borrower's z-score fell below 0.3 over the life of the loan, and zero otherwise (*Z-score2*), iv) a binary variable that equals one if the borrower filed for bankruptcy under Chapter 7 or 11 over the life of the loan, and zero otherwise (*Bankrupt*), using data from Capital IQ.

Borrower characteristics include size, ROA, leverage, liquidity, credit rating (when covenant violations and z-score are used as dependent variables), Herfindahl index and capital assets, z-score at the time of loan origination (*Z_score_beg.*) and borrower's credit rating (*Credit rating*). Loan characteristics include loan maturity, loan size, LIBOR spread, number of co-syndicates, an indicator whether the loan includes a performance pricing provision, and an indicator for financial covenants. I further control for year, industry and loan purpose fixed effects. The variable definitions are reported in Appendix A.

6. Descriptive statistics and results

6.1. Descriptive statistics

Table 3 reports summary statistics for loan, borrower and intangibles characteristics used in the regressions. The average borrower size is $1.7 billion, with average intangible assets (excluding

goodwill) of $272 million. The average firm in my sample has 62 patents, 9 registered active trademarks and 5 active registered copyrights at the time of loan origination. However, there is significant variation in the number of patents, trademarks and copyrights, with standard deviations of 568.4, 30.3 and 61.9 respectively. The average leverage ratio is 1.64 and operating income is 8 percent of total assets. The average credit rating is BB-. The average loan size is $232 million, ranging from a low of $10 million to a high of $875 million. The maturity of these loans averages 33.5 months, and the average spread over LIBOR on the drawn amount plus the annual fee is 261 basis points. Approximately 60 percent of the loans include at least one financial or net worth covenant, and 52 percent have a performance pricing provision. Finally, 26 percent of the loans have institutional tranches and 14 percent are originated from unregulated lead lenders.

Table 3: Summary Statistics

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
Collateral_Intangibles	1,415	0.26	0.44	0.00	0.00	0.00	1.00	1.00
Loanamt_Assets	1,415	0.34	0.26	0.05	0.12	0.27	0.48	0.89
Intangible_Liquidity	1,415	0.31	0.46	0.00	0.00	0.00	1.00	1.00
Customers	1,415	0.62	0.78	0.00	0.00	0.62	0.69	4.01
Indirect_Competitors	1,415	3.15	1.13	0.69	2.56	3.37	3.93	4.82
Credit_Downgrades	761	0.49	0.83	0.00	0.00	0.00	0.79	4.34
Credit_Downgrade2	761	0.42	0.49	0.00	0.00	0.00	1.00	1.00
Covenant_Violations	854	0.88	1.45	0.00	0.00	0.00	0.97	5.65
Covenant_Violation2	854	0.44	0.50	0.00	0.00	0.00	1.00	1.00
Z-Score	1,415	0.37	0.97	0.00	0.00	0.00	0.00	4.29
Z-Score2	1,415	0.18	0.39	0.00	0.00	0.00	0.00	1.00
Z_score_beg.	1,415	1.23	0.82	0.12	0.64	1.09	1.63	3.64
Bankrupt	1,415	0.15	0.36	0.00	0.00	0.00	0.00	1.00
Lending_Relationships	1,415	0.45	0.32	0.00	0.19	0.33	0.70	1.00
Distance	1,415	6.68	1.98	0.00	7.02	7.32	7.32	9.21
Unregulated_Lead	1,415	0.14	0.34	0.00	0.00	0.00	0.00	1.00
Institutional	1,415	0.26	0.44	0.00	0.00	0.00	1.00	1.00
Intangibles	1,415	0.16	0.03	0.04	0.17	0.17	0.17	0.25
Goodwill	1,415	0.12	0.10	0.00	0.00	0.12	0.13	0.43
Market-to-Book	1,415	1.96	1.23	0.12	1.08	2.08	2.22	4.83
Patents	1,415	1.09	1.80	0.00	0.00	1.13	1.95	9.84
Trademarks_Copyrights	1,415	1.54	1.62	0.00	0.00	1.10	2.64	9.15

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
G-Index	1,415	9.01	0.95	6.85	8.90	9.01	9.05	11.35
Leverage	1,415	1.64	1.28	0.10	0.40	1.25	3.06	3.49
Liquidity	1,415	1.95	0.91	0.69	1.30	1.96	2.14	4.38
Capital Assets	1,415	0.29	0.20	0.03	0.13	0.30	0.39	0.78
ROA	1,415	0.08	0.11	-0.24	0.06	0.08	0.14	0.26
Herf_Index	1,415	0.04	0.03	0.002	0.01	0.03	0.07	0.10
Rated	1,415	0.53	0.50	0.00	0.00	1.00	1.00	1.00
Credit Rating	761	13.67	2.61	6.00	12.00	14.00	15.00	21.00
Size	1,415	6.14	1.67	0.20	4.97	6.34	7.44	11.97
Competitors	1,415	3.64	1.31	0.00	2.77	3.52	4.45	6.48
Loan_Size	1,415	4.66	1.33	0.15	3.81	4.61	5.62	7.89
Maturity	1,415	3.16	0.76	2.40	2.56	2.71	4.01	5.52
Fin_Covenant	1,415	0.60	0.49	0.00	0.00	1.00	1.00	1.00
Syndicates	1,415	4.75	4.24	1.00	1.00	3.00	7.00	13.00
Perfprice	1,415	0.52	0.50	0.00	0.00	1.00	1.00	1.00
LIBOR-spead	1,415	261.61	89.21	87.50	189.74	255.00	330.00	455.00

Table 3: Summary statistics. Variables are described in Appendix A. All values of the continuous variables are winsorized at 1% and 99% level.

In terms of my main variables of interest, Table 3 shows that 31 percent of the firms in my sample license their intangibles to third parties. The average firm in my sample reports approximately 3 key customers and has 39 indirect competitors. The mean strength of prior lending relationships is 0.45, suggesting that firms in my sample have developed strong ties with their lenders over time. Covenant violations and credit downgrades are frequent for these firms: the mean probability of covenant violations and credit downgrades is 44 percent and 42 percent respectively, consistent with the fact that the borrowers in my sample have low credit ratings.

In Table 4, I segregate the loans in my sample based on the assets used as collateral. In the first column, I report intangible, loan and borrower characteristics for loans secured by tangible assets. The second column provides the same information for loans secured by tangibles and intangibles. The last column reports the differences in average loan, borrower and intangible characteristics between loans secured by tangibles and loans secured by tangibles and intangibles. The results of the univariate tests of differences in means provide strong evidence that collateralizing intangible assets is positively related to intangible liquidity, number of customers and indirect competitors and strong lending relationships. Moreover, the results suggest that loans secured by intangibles have higher spread, shorter maturity, greater size deflated by total assets and fewer co-syndicates.

Table 4: Loan and borrower characteristics: tangible and intangible collateral

Variable	Loans secured by tangibles (A)	Loans secured by tangibles and intangibles (B)	t-statistic (A)-(B)
Loanamt_Assets	0.31	0.42	-6.58***
	(0.24)	(0.30)	
Unregulated_Lead	0.11	0.20	-4.42***
	(0.32)	(0.40)	
Institutional	0.22	0.28	-2.37**
	(0.41)	(0.45)	
Loan_Size	4.77	4.36	5.09***
	(1.33)	(1.27)	
Maturity	3.21	2.99	4.79***
	(0.76)	(0.72)	
Fin_Covenant	0.57	0.66	-3.07***
	(0.49)	(0.47)	
LIBOR-spread	253.63	284.90	-5.81***
	(89.66)	(83.77)	

Table 4 (Continued)

Variable	Loans secured by tangibles (A)	Loans secured by tangibles and intangibles (B)	t-statistic (A)-(B)
Intangible_Liquidity	0.28	0.43	-5.40***
	(0.45)	(0.50)	
Customers	2.65	3.55	-3.52***
	(3.53)	(4.84)	
Indirect_Competitors	3.16	3.34	-2.58***
	(1.11)	(1.10)	
Credit_Downgrades	0.47	0.52	-0.61
	(0.82)	(0.84)	
Credit_Downgrade2	0.42	0.42	0.02
	(0.49)	(0.49)	
Covenant_Violations	0.83	0.99	-1.54
	(1.39)	(1.59)	
Covenant_Violation2	0.43	0.47	-1.13
	(0.50)	(0.50)	
Z-Score	0.39	0.28	1.50
	(1.01)	(0.84)	
Z-Score2	0.38	0.35	1.13
	(0.48)	(0.49)	
Bankrupt	0.16	0.13	1.29
	(0.36)	(0.33)	
Lending_Relationships	0.42	0.57	-7.72***
	(0.31)	(0.35)	
Distance	6.80	6.31	4.14***
	(1.74)	(2.51)	
Intangibles	0.16	0.17	-1.87*
	(0.06)	(0.06)	
Market-to-Book	1.96	1.98	-0.26
	(1.20)	(1.29)	
Patents	1.12	1.02	0.86
	(1.87)	(1.60)	
Trademarks_Copyrights	1.55	1.48	0.76
	(1.63)	(1.60)	
G-Index	9.01	9.02	-0.19
	(0.96)	(0.93)	

Table 4 (Continued)

Variable	Loans secured by tangibles (A)	Loans secured by tangibles and intangibles (B)	t-statistic (A)-(B)
Leverage	1.67	1.54	1.71*
	(1.26)	(1.28)	
Liquidity	1.95	1.94	0.11
	(0.91)	(0.91)	
Capital Assets	0.31	0.26	4.13***
	(0.21)	(0.18)	
ROA	0.09	0.06	4.29***
	(0.10)	(0.13)	
Herf_Index	0.04	0.03	5.3***
	(0.03)	(0.03)	
Rated	0.56	0.42	4.75***
	(0.50)	(0.49)	
Goodwill	0.12	0.10	1.88*
	(0.12)	(0.11)	
Competitors	3.60	3.71	-1.36
	(1.31)	(1.28)	
Size	6.32	5.61	7.05***
	(1.61)	(1.78)	

Table 4: Summary statistics- loans secured by tangibles versus loans secured by intangibles. Variables are described in Appendix A. Standard deviations reported in parentheses. All values of the continuous variables are winsorized at 1% and 99% level. ***Significant at 1%, ** 5% and * 10% level.

Untabulated univariate correlations between the probability of using intangibles as loan collateral and the other variables indicate that the use of intangible assets as collateral is positively related to intangible liquidity (0.15), the number of customers (0.10), the number of indirect competitors (0.09), strong lending relationships (0.21) and loan size to total assets (0.17). The use of intangibles as loan collateral is negatively associated with the distance between lenders' and borrowers' headquarters (-0.14). Moreover, collateralizing loans by intangibles is weakly correlated to loan performance.

6.2. Results

6.2.1. *Determinants of the collateralization of intangible assets*

Table 5 reports marginal effects for the probit regressions of the first and second hypotheses (H1 and H2) that predict which intangibles and borrower characteristics are positively related to the probability of collateralizing intangible assets. In all specifications, the coefficients on *Intangible_Liquidity* and *Customers* are significantly positive (p-value <0.01). This is consistent with H1, i.e. that liquid and redeployable intangibles are used as loan collateral. The unconditional probability of using intangibles as loan collateral is 26 percent which increases by approximately 13 percent if borrowers license their intangibles to third parties (*Intangible_Liquidity*). An increase by one standard deviation in *Customers* increases the probability of pledging intangibles as collateral by 4 percent. The coefficient on *Lending_Relationships* and *Distance* are significantly positive (p-value ≤0.05), consistent with H2, i.e. that borrower reputation is positively related to the probability of using intangibles as loan collateral. An increase by one standard deviation in *Lending_Relationships* increases the probability of pledging intangibles as collateral by approximately 5 percent. Similarly, a decrease by one standard deviation in *Distance* increases the probability of pledging intangibles as collateral by 2.3 percent. The results hold controlling for fixed characteristics across lead lenders.

Furthermore, transaction costs significantly affect the probability of collateralizing intangibles, suggesting that lenders' risk tolerance influences the adoption of this credit practice. Specifically, borrowing from an unregulated lead lender (investment banks, finance companies, etc.) increases by 11 percent the probability of leveraging intangibles. The value of borrower intangibles does not influence the collateralization of intangibles, consistent with the fact that

Table 5: Intangible collateralization and information asymmetry

Dependent Variable: Collateral_Intangibles										
Variable	dF/dx	p>|z|	dF/dx	p>|z|	dF/dx	p>|z|	dF/dx	p>|z|	dF/dx	p>|z|
Intangible_Liquidity			**0.131 *****	**0.00**			**0.127 *****	**0.00**	**0.148 *****	**0.00**
Customers			**0.055 *****	**0.00**			**0.051 *****	**0.00**	**0.048 *****	**0.00**
Indirect_Competitors			**0.036**	**0.18**			**0.040 ***	**0.10**	**0.024**	**0.38**
Lending_Relationships					**0.171 *****	**0.00**	**0.150 *****	**0.00**	**0.162 *****	**0.00**
Distance					**-0.011 ****	**0.05**	**-0.012 ****	**0.04**	**-0.012 ****	**0.05**
Unregulated_Lead	0.122 ***	0.00	0.101 ***	0.01	0.130 ***	0.00	0.111 ***	0.01		
Institutional	0.021	0.56	0.004	0.91	0.011	0.76	-0.002	0.95	0.010	0.79
Patents	-0.009	0.36	-0.011	0.22	-0.009	0.35	-0.012	0.21	-0.015	0.13
Trademarks_Copyrights	-0.005	0.62	-0.011	0.24	-0.004	0.69	-0.010	0.28	-0.010	0.31
Intangibles	0.042	0.85	0.032	0.89	0.037	0.87	0.015	0.95	0.003	0.99
Market-to-Book	0.006	0.55	0.001	0.95	0.002	0.84	-0.002	0.83	0.002	0.88
G-Index	-0.022	0.13	-0.019	0.17	-0.026 *	0.08	-0.022 *	0.10	-0.021	0.16
Herf_Index	-3.278 ***	0.00	-3.850 ***	0.00	-3.248 ***	0.00	-3.725 **	0.00	-3.544 **	0.05
Rated	-0.032	0.35	-0.034	0.33	-0.011	0.75	-0.015	0.66	-0.007	0.85
Z_score_beg.	-0.015	0.49	0.003	0.87	-0.011	0.61	0.006	0.77	0.007	0.77
Leverage	0.005	0.76	0.009	0.16	0.005	0.38	0.009	0.14	0.009	0.18
Liquidity	-0.025 ***	0.01	-0.021 **	0.04	-0.026 ***	0.01	-0.024 **	0.02	-0.019 *	0.06
Capital Assets	-0.186 **	0.04	-0.126	0.17	-0.169 *	0.06	-0.118	0.19	-0.089	0.35
ROA	-0.088	0.48	-0.074	0.55	-0.060	0.63	-0.053	0.67	-0.027	0.85
Size	-0.012	0.35	-0.012	0.34	-0.009	0.48	-0.008	0.52	-0.008	0.53
Loan_Size	0.010	0.57	0.009	0.59	0.017	0.32	0.015	0.35	0.023	0.20
Maturity	-0.044 ***	0.00	-0.044 ***	0.00	-0.039 ***	0.00	-0.039 **	0.00	-0.048 ***	0.00
Fin_Covenant	0.037	0.26	0.041	0.21	0.035	0.30	0.038	0.25	0.023	0.50
Perfprice	-0.061 **	0.03	-0.053 *	0.06	-0.055 **	0.05	-0.052 *	0.06	-0.044	0.13
Syndicates	-0.030 **	0.03	-0.029 **	0.03	-0.022 *	0.10	-0.022 *	0.10	-0.020	0.16
Fixed effects:										
Year, Industry, Purpose	YES		YES		YES		YES		YES	
Lead lender	NO		NO		NO		NO		YES	
	N= 1,415		N= 1,415		N= 1,415		N= 1,415		N= 1,271	
	pseudo R^2= 0.13		pseudo R^2= 0.18		pseudo R^2= 0.15		pseudo R^2= 0.20		pseudo R^2= 0.26	

Table 5: Relation between intangible collateralization, information asymmetry, intangible redeployability and liquidity. The dependent variable is a binary variable that equals one if the loan includes intangibles as loan collateral, and zero if the loan is secured by tangibles. Marginal effects reported. Cluster is at the borrower level and standard errors are corrected for heteroskedasticity. All values of the continuous variables are winsorized at 1% and 99% level. Fixed effects for year, industry (2-digit SIC), lead lender and loan purpose are included. Variables are described in Appendix A. ***Significant at 1%, ** 5% and * 10% level, two-tailed tests.

under certain conditions intangibles are valuable collateral and lending against intangibles is a "niche" segment in the corporate loan market. However, I do find that management characteristics that increase firm value (G-Index) positively affect the probability of using intangibles as collateral, consistent with the fact that firm value and the value of specialized assets are highly correlated. Finally, small borrowers (*Herf_Index*) with liquidity constraints (*Liquidity*) are likely to pledge their intangibles as collateral in loan agreements. Overall, I find evidence consistent with lenders' thoughtfully selecting on intangible and borrower characteristics that enhance the ability of intangibles to serve as collateral.

6.2.2. *The collateralization of intangible assets, loan pricing and credit availability*

Table 6 reports results for the tests of my third hypothesis (H3), i.e. whether collateralizing intangibles increases loan size and pricing. Because loan terms are simultaneously determined, I jointly model the decision of using intangibles as loan collateral, loan size and pricing. The F-tests confirm the instrument relevance (untabulated). I find that using intangibles as collateral increases loan size by approximately 18 percent and loan pricing by 74 basis points. For an average loan of $232 million and three years maturity, this represents approximately $4.1 million in interest expenses. For an average firm with assets of $1.7 billion, the increase in loan size represents 3 percent of total assets. Moreover, the average firm in my sample that pledged intangibles as collateral has intangible assets of $237 million (excluding goodwill), thus these borrowers successfully leveraged approximately 18 percent of the value of their intangible assets. Finally, the pricing of loans secured by intangibles remained high during the recent credit boom (Figure 2), indicating the high quality of lenders' costly due diligence when appraising intangible collateral value.

Table 6: Intangible collateralization, loan size and LIBOR-spread

Dependent variable:	Loan_Size		Collateral_Intangibles	
Variable	**Coeff.**	**p>|t|**	**Coeff.**	**p>|z|**
Collateral_Intangibles	**0.167 ****	**0.05**		
Loan_Size			0.207	0.14
Goodwill	0.148 ***	0.00		
Intangible_Liquidity			0.397 ***	0.00
Customers			0.151 ***	0.01
Lending_Relationships	-0.653 ***	0.00	0.423 **	0.03
Distance			-0.054 ***	0.01
Unregulated_Lead			0.476 ***	0.00
G-index			-0.055	0.22
Herf_Index	10.540 ***	0.00	-8.312	0.69
Institutional	0.224 ***	0.00	0.117	0.49
Syndicates	0.136 ***	0.00	0.005	0.95
Rated	0.446 ***	0.00	0.086	0.77
Fin_Covenant	-0.233 ***	0.00	0.127	0.44
Perfprice	0.286 ***	0.00	-0.056	0.76
Z_score_beg.	-0.044	0.22	0.072	0.28
Leverage	0.011	0.35	0.029	0.21
Liquidity	-0.044	0.13	-0.060	0.34
Capital Assets	0.106	0.44	-0.199 *	0.09
ROA	-0.139	0.57	-0.476	0.26
Maturity	-0.156 ***	0.00	-0.129	0.24
Size	0.123 ***	0.00	0.009	0.90
Constant	4.026 ***	0.00	0.370 *	0.06
	N= 1,415		N= 1,415	
	R^2= 0.65		pseudo R^2= 0.13	

Endogenous variables: Loan_Size, Collateral_Intangibles

Instruments: Goodwill, Intangibles_Liquidity, Customers

Table 6 (Continued)

Dependent variable:	LIBOR-spread		Collateral_Intangibles	
Variable	**Coeff.**	**p>|t|**	**Coeff.**	**p>|z|**
Collateral_Intangibles	73.872 **	0.04		
LIBOR-spread			0.010 *	0.07
Competitors	10.925 ***	0.00		
Intangible_Liquidity			0.441 ***	0.00
Customers			0.138 ***	0.01
Z_score_beg.	0.628	0.83	0.077	0.16
Loan_Size	-5.481 *	0.07	0.225	0.15
G-index			-0.035	0.41
Maturity	3.827 *	0.07	-0.131 *	0.06
Lending_Relationships	-27.788 ***	0.01	0.391 ***	0.00
Distance	0.502	0.67	-0.039 ***	0.01
Unregulated_Lead	-2.091	0.79	0.444 ***	0.00
Institutional	43.398 ***	0.00	0.114	0.33
Syndicates	-1.192	0.12	-0.025 *	0.10
Rated	-11.692 **	0.03	0.010	0.92
Herf_Index	-87.940	0.63	-11.860 ***	0.00
Fin_Covenant	12.572 **	0.03	0.127	0.25
Perfprice	-22.435 ***	0.00	-0.170	0.14
Leverage	9.214 ***	0.00	0.042	0.18
Liquidity	-1.775	0.51	-0.020	0.16
Capital Assets	12.708	0.33	-0.299	0.19
ROA	-123.446 ***	0.00	-0.406	0.23
Size	-6.401 ***	0.00	-0.066	0.11
Constant	0.628	0.83	0.077	0.16
	N= 1,415		N= 1,415	
	R^2= 0.28		pseudo R^2= 0.13	
Endogenous variables: LIBOR-spread, Collateral_Intangibles				
Instruments: Competitors, Intangibles_Liquidity, Customers				

Table 6: Intangible collateralization, loan size and spread (simultaneous model). The jointly determined dependent variables are the LIBOR-spread and the probability of using intangibles as collateral (Panel A), and the loan size and the intangible collateral probability (Panel B). All values of the continuous variables are winsorized at 1% and 99% level. Fixed effects for year, industry (2-digit SIC) and loan purpose are included. ***Significant at 1%, ** 5% and * 10% level, two-tailed tests.

Figure 2: Intangible collateralization and loan spread, 1996-2005
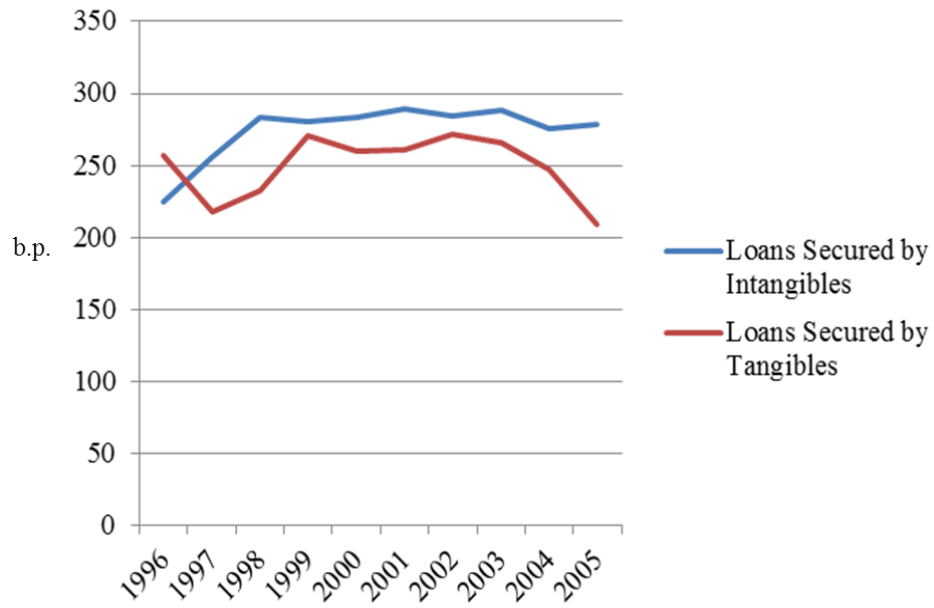

Figure 2: Pricing of loans secured by intangibles. This figure shows the trend in pricing of loans secured by intangibles and intangibles. The graph suggests that pricing of loans secured by intangibles was not affected by the credit boom.

6.2.3. The collateralization of intangible assets and loan performance

Table 7 reports results for the tests of my fourth hypothesis (H4), i.e. whether loans secured by intangibles are better or worse quality than other secured loans. The results suggest that collateralizing a loan by intangibles does not predict deterioration in credit ratings. Using borrower's z-score, credit rating downgrades or covenant violations as proxies for loan performance, I find no significant difference between loans secured by tangibles and loans that include intangibles as collateral. In fact, using bankruptcy rates as a proxy for loan performance I find that firms that pledged their intangibles as loan collateral are 4 percent less likely to file for bankruptcy over the life of the loan. While none of these measures are perfect, the results suggest that loans secured by intangibles are of similar quality to other secured loans, implying that lenders that accepted intangible assets were not worse off than other secured lenders.

Overall, my findings are consistent with the hypothesis that the collateralization of intangibles is an economically valuable credit market innovation. Several factors explain my results. First, the syndication structure of loans secured by intangibles involves fewer co-syndicates (loan participants). In addition, the lender that originated the loan (the lead lender) retains a greater fraction of the loan on its balance sheet, thus credit risk is not largely diversified away. Second, loans secured by intangibles are harder to securitize or trade in the secondary loan market due to higher proprietary information costs associated with the underlying collateral.[13] Thus, credit risk cannot be easily transferred after loan origination.

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[13] Indeed, using data from Creditflux CLO-i on securitized corporate loans and LPC secondary loan trading I find that approximately 8 percent of the loans secured by intangibles are securitized or traded.

Table 7: Intangible collateralization and loan performance

Dependent Variable:	Credit_ Downgrades		Credit_ Downgrades2		Covenant_ Violations		Covenant_ Violations2	
Variable	Coeff.	p>|t|	dF/dx	p>|z|	Coeff.	p>|t|	dF/dx	p>|z|
Collateral_Intangibles	**-0.018**	**0.65**	**0.028**	**0.66**	**-0.024**	**0.84**	**-0.038**	**0.44**
Syndicates	0.000	0.72	0.000	0.95	-0.008	0.27	-0.003	0.48
Loan_Size	0.157 ***	0.00	0.080 **	0.02	-0.011	0.88	-0.004	0.92
Maturity	-0.330 **	0.05	0.017	0.74	-0.590 ***	0.00	-0.018	0.75
Fin_Covenant	0.049	0.33	-0.020	0.78				
LIBOR-spread	0.001 **	0.04	0.001 **	0.02	0.001 **	0.05	0.001 *	0.09
Perfprice	0.004	0.87	0.045	0.45	0.135	0.30	0.050	0.35
Credit rating	0.025	0.77	-0.001	0.94				
Rated					-0.539 ***	0.00	-0.075	0.25
Z_score_beg.	-0.015	0.31	-0.050	0.37	-0.182 *	0.08	-0.027	0.51
Herf_Index	2.168	0.51	0.492	0.79	-1.404	0.72	-1.538	0.36
Leverage	-0.051 ***	0.00	-0.031 **	0.02	0.092 ***	0.01	0.037 ***	0.01
Liquidity	-0.013	0.99	-0.011	0.76	-0.117 **	0.05	-0.052 **	0.03
Capital Assets	-0.105	0.49	0.053	0.77	0.418	0.30	0.243	0.12
Intangibles	1.879 **	0.03	1.217	0.11	1.610	0.28	0.318	0.62
Market-to-Book	0.069 *	0.07	0.043 *	0.07	-0.127 ***	0.01	-0.036 **	0.05
ROA	1.057	0.37	0.477	0.25	-1.588 ***	0.01	-0.221	0.32
Size	0.035	0.74	0.056	0.13	-0.009	0.90	-0.055 ***	0.05
Constant	-1.400 ***	0.00			3.044 ***	0.00		
Fixed effects: Year-Industry-Loan purpose								
	N= 761		N= 761		N= 854		N= 854	
	R^2= 0.24		pseudo R^2= 0.19		R^2= 0.28		pseudo R^2= 0.18	

Table 7: Intangible collateralization and loan performance. The dependent variable in column I is the number of credit rating downgrades over the life of the loan (adjusted to loan maturity), the dependent variable in column II is the probability of a credit rating downgrade, the dependent variable in column III is the number of covenant violations (adjusted to loan maturity) and the dependent variable in column IV is the probability of a covenant violation. Column I and III report OLS estimates, column II and IV report marginal effects. Cluster is at the borrower level and standard errors are corrected for heteroskedasticity. All values of the continuous variables are winsorized at 1% and 99% level. Fixed effects for year, industry (2-digit SIC) and loan purpose are included. Variables are described in Appendix A. ***Significant at 1%, ** 5% and * 10% level, two-tailed tests.

Table 7 (Continued)

Dependent Variable:	Z-Score		Z-Score2		Bankrupt	
Variable	Coeff.	p>|t|	dF/dx	p>|z|	dF/dx	p>|z|
Collateral_Intangibles	**0.053**	**0.31**	**0.001**	**0.30**	**-0.036 ***	**0.09**
Syndicates	0.000	0.95	0.000	0.14	-0.001	0.63
Loan_Size	0.020	0.53	0.000	0.12	-0.036 ***	0.00
Maturity	-0.182 ***	0.00	0.000	0.70	-0.057 ***	0.00
Fin_Covenant	-0.005	0.94	0.000	0.62	-0.026	0.33
LIBOR-spread	0.000	0.99	0.000	0.52	0.001 ***	0.00
Perfprice	0.050	0.37	-0.001	0.33	-0.021	0.34
Rated	0.109	0.12	0.000	0.59	0.118 ***	0.00
Z_score_beg.	0.251 ***	0.00	0.015 ***	0.00	0.010	0.58
Herf_Index	-0.098	0.97	-0.024	0.16	-0.828	0.28
Leverage	-0.014	0.33	0.000	0.66	0.016 **	0.02
Liquidity	0.042	0.21	0.001 *	0.06	-0.008	0.47
Capital Assets	0.211	0.36	0.000	0.86	0.158 **	0.04
Intangibles	-0.718	0.19	0.005	0.33	-0.547	0.13
Market-to-Book	0.018	0.35	0.000	0.89	-0.012	0.16
ROA	-0.938 ***	0.00	-0.004 *	0.10	-0.205 **	0.04
Size	0.015	0.61	0.000 *	0.06	0.003	0.73
Constant	0.970 ***	0.00				
Fixed effects: Year-Industry-Loan purpose						
	N= 1,415		N= 1,415		N= 1,415	
	R^2= 0.48		pseudo R^2= 0.25		pseudo R^2= 0.22	

Table 7: Intangible collateralization and loan performance. The dependent variable in column I is number of years that Z-score fell below 0.3 over the life of the loan (adjusted to loan maturity), the dependent variable in column II is the probability of this event and the dependent variable in column III is the probability of borrower's filing for bankruptcy. Column I reports OLS estimates, column II and III report marginal effects. Cluster is at the borrower level and standard errors are corrected for heteroskedasticity. All values of the continuous variables are winsorized at 1% and 99% level. Fixed effects for year, industry (2-digit SIC) and loan purpose are included. Variables are described in Appendix A. ***Significant at 1%, ** 5% and * 10% level, two-tailed tests.

7. Robustness tests

I perform a series of robustness tests to ensure that the results are not driven by the research design choices in the primary analysis. The first eight robustness checks refer to untabulated tests. First, I use the number of borrower's suppliers as a proxy for intangibles redeployability. Because data on suppliers are not available for every firm in my sample, my sample size decreases by 60 percent. The effect of intangible redeployability on the probability of using intangibles as collateral is positive and statistically significant, but less economically significant. Second, I exclude firms in regulated industries (2-digit SIC: 40-45), because these firms have different capital needs and constraints. I further exclude loans with size in the lowest decile (loan amount<$30 million) to eliminate small and less economically significant deals. The results hold in both specifications. Third, I use the book value of assets pledged as collateral as an independent variable in the simultaneous equation model (Table 6) to control whether the effect is driven by differences in the underlying collateral value, and the results hold. Fourth, coefficient estimates from maximum likelihood models that include dummy variables to estimate fixed effects are biased (Madalla, 1987). However, the coefficient bias in these models tends to zero as the number of within-group observations increases (Wooldridge, 2002). While I constructed my sample taking a significant number of within-group observations, to further allay this concern I use a conditional logit model grouping loans by industry, year and loan purpose. The results hold in this specification. Fifth, I test whether the effect of strong prior lending relationships on the collateralization of intangibles is driven by unobservable characteristics. Specifically, a lead lender might extend credit to a relationship borrower without conducting a careful due diligence on borrower's assets. While syndicated loans are large corporate loans and involve a group of formal screeners, I eliminate potential bias from unobservable characteristics

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by defining lending relationships as the size of large loans (i.e. greater than 20 percent of borrower's assets) that a borrower raised from a lead lender over the last five years prior to loan origination, deflated by the total number of loans that the borrower raised in this period. The results hold in this specification. Sixth, I test the effect of collateralizing loans by intangibles on future loan performance (credit ratings, bankruptcy rates and z-score) using a subsample of loans that do not include financial covenants to allay the concern that loan performance is driven by lender's higher monitoring effort, and the results hold. Seventh, I test the effect of collateralizing loans by intangibles on future loan performance using industry-adjusted bankruptcy rates, and the results hold. Eighth, to explore whether economic considerations in collateralizing loans by intangibles and loan performance differ over time, I test my hypotheses using the following three subsamples: loans originated before 2000, loans originated after 2000 and loans that matured after 2007. The results in my main specification are similar across these subsamples.

Finally, I test whether selection bias affects my results, as the probability of using intangibles as collateral depends on lenders' decision to take collateral. I follow Core and Guay (1999) and I use a Heckman selection model to correct for potential bias by including unsecured loans in my sample. I increase the size of my sample by adding 2,538 unsecured loans to 1,195 unique public companies during 1996-2005. I exclude companies that took a secured loan three years after and prior to an unsecured loan. The first stage is a logit model where the dependent variable is the probability of securing a loan. The independent variables include borrower's liquidity, ROA, leverage, rating, capital assets, intangible assets, size, lending relationships, loan size, loan purpose, financial covenants, performance pricing provisions and loan maturity. The results hold with those alternative specifications (untabulated tests).

Furthermore, I test whether borrower's accounting quality increases the probability of pledging intangible assets as collateral. While accounting numbers do not capture the total value of borrower's identifiable intangibles, the relation between accruals and future performance mitigates information asymmetry in intangibles, as the value of specialized firm-specific assets (i.e. intangibles) is correlated with firm value. Thus, managers' accounting choices that increase the predictability of borrower's future performance signal lower uncertainty in the value of borrower's intangible assets. I follow Bushman and Wittenberg-Moerman (2011) and regress one-year-lag earnings on contemporaneous earnings, requiring at least five years of available data. I find that borrowers that pledged their intangible assets as collateral exhibit higher earnings persistence to other borrowers in the secured loan market (Table 8). Specifically, an increase by one standard deviation in earnings persistence increases the probability of pledging intangibles as collateral by 3 percent. However, the effect is statistically insignificant after controlling for lead lender fixed effects, suggesting that several lead lenders have expertise in lending against intangibles.

In my tests, I compare loans that include intangible assets as collateral to loans secured only by tangible assets. I further use two additional benchmarks: I compare loans secured by intangibles to loans secured by tangibles and unsecured loans. Table 9 reports results of the test. I find that borrowers taking loans secured by intangibles are equally reputable to borrowers taking unsecured loans. However, these borrowers are highly leveraged small firms, consistent with the fact that lenders will demand for collateral. Moreover, I run the test on the determinants of collateralizing loans by intangible assets (H1 and H2) matching loans on the underlying value of the assets pledged as collateral. Since the loan to value ratio of the assets pledged as collateral is unobservable, I use the book value of assets pledged as collateral deflated by loan size. I include

Table 8: Intangible collateralization and earnings persistence

Dependent Variable: Collateral_Intangibles				
Variable	**dF/dx**	**p>|z|**	**dF/dx**	**p>|z|**
Earnings_Persistence	**0.078 ***	**0.07**	**0.058**	**0.19**
Intangible_Liquidity	0.125 ***	0.00	0.143 ***	0.00
Customers	0.047 ***	0.00	0.047 ***	0.01
Indirect_Competitors	0.039	0.15	0.020	0.47
Lending_Relationships	0.139 ***	0.01	0.157 ***	0.00
Distance	-0.010 *	0.10	-0.011 *	0.09
Unregulated_Lead	0.113 ***	0.01		
Institutional	0.005	0.88	0.020	0.60
Patents	-0.013	0.15	-0.016 *	0.10
Trademarks_Copyrights	-0.011	0.25	-0.009	0.33
Intangibles	0.008	0.97	0.003	0.99
Market-to-Book	-0.001	0.94	0.002	0.89
G-Index	-0.019	0.20	-0.018	0.22
Herf_Index	-3.862 ***	0.00	-3.551 **	0.05
Rated	-0.018	0.62	-0.012	0.74
Z_score_beg.	0.006	0.79	0.006	0.81
Leverage	0.003	0.16	0.002	0.33
Liquidity	-0.026 ***	0.01	-0.021 *	0.07
Capital Assets	-0.115	0.22	-0.079	0.42
ROA	-0.054	0.66	-0.026	0.86
Size	-0.003	0.80	-0.004	0.75
Loan_Size	0.019	0.27	0.023	0.21
Maturity	-0.037 ***	0.00	-0.049 ***	0.00
Fin_Covenant	0.033	0.32	0.016	0.64
Perfprice	-0.055 **	0.05	-0.046	0.12
Syndicates	-0.023	0.17	-0.024	0.17
Fixed effects:				
Year, Industry, Purpose	YES		YES	
Lead lender	NO		YES	
	N= 1,383		N= 1,239	
	pseudo R^2= 0.19		pseudo R^2= 0.24	

Table 8: Intangible collateralization and accounting quality. The dependent variable is a binary variable that equals one if the loan includes intangibles as loan collateral, and zero if the loan is secured by tangibles. Earnings persistence is the coefficient in the regression of earnings on prior year earnings (deflated by total assets). Marginal effects reported. Cluster is at the borrower level and standard errors are corrected for heteroskedasticity. All values of the continuous variables are winsorized at 1% and 99% level. Fixed effects for year, industry (2-digit SIC), lead lender and loan purpose are included. Variables are described in Appendix A. ***Significant at 1%, ** 5% and * 10% level, two-tailed tests.

R&D and advertising expenses in estimating the collateral value of intangible assets to capture off-the-balance sheet intangibles. The matched sample includes 705 loans. The test confirms that lenders carefully select on borrower and intangible characteristics that alleviate information asymmetry in intangibles (Table 10). Similarly, I find that the collateralization of intangibles increases loan pricing by 81 basis points (untabulated test). Finally, I estimate a treatment effect model to eliminate endogeneity bias using the instruments described in section 5. The results of the test are consistent with the results of the simultaneous equation model in my primary analysis (Table 11).

Table 9: Secured and unsecured loans: multinomial logistic regression

Dependent variables:	Collateral_Tangibles		Collateral_Intangibles		Collateral_Tangibles		Collateral_Intangibles	
Variable	Relative risk ratio	z	Relative risk ratio	z	Relative risk ratio	z	Relative risk ratio	z
Intangible_Liquidity					1.75	1.16	3.09 *	1.79
Customers	0.22 ***	-2.33	0.28 *	-1.70	0.94 ***	-2.23	1.21	0.71
Indirect_Competitors	0.48	-1.05	0.16	-0.93	0.85	-0.50	1.18	0.47
Lending_Relationships	0.00 ***	-2.78	0.67	-0.57	0.01 ***	-5.18	0.47	-0.85
Unregulated_Lead	2.04	0.39	5.51	0.93	0.67	-0.68	1.68	0.86
Institutional	9.82 ***	2.29	13.02 ***	2.45	2.81 *	1.78	3.74 *	1.84
Patents	0.79	-0.76	0.78	-0.80	0.94	-0.56	0.91	-0.73
Trademarks_Copyrights	2.02 *	1.70	2.04 *	1.71	1.06	0.31	1.03	0.17
Intangibles	0.04	-0.69	0.07	-0.58	0.09	-1.36	0.11	-1.10
Market-to-Book	0.74	-1.00	0.74	-0.98	0.99	-0.09	0.99	-0.07
G-Index	0.19 ***	5.05	0.16	1.34				
Herf_Index	0.01	-0.18	0.01	-0.62	0.00	-1.02	0.01 ***	-2.13
Rated	6.73	1.47	2.49	0.70	8.43	3.29	3.07	1.55
Leverage	4.55 ***	4.27	5.21 ***	4.34	5.29 ***	7.02	6.90 ***	7.20
Liquidity	0.73	-0.53	0.55	-0.99	1.15	0.78	0.88	-0.65
Capital Assets	0.03 ***	-4.93	0.01 ***	-5.18	0.03 ***	-6.77	0.00 ***	-7.00
ROA	0.01	-0.95	0.01	-0.94	0.00 ***	-3.36	0.00 ***	-3.06
Size	0.03 ***	-4.70	0.03 ***	-4.42	0.13 ***	-6.45	0.16 ***	-5.57
Maturity	0.01 ***	-4.86	0.01 ***	-5.12	0.12 ***	-6.95	0.10 ***	-7.82
Fin_Covenant	0.01 ***	-3.10	0.01 ***	-3.02	0.16 ***	-3.60	0.17 ***	-3.43
Perfprice	10.60 **	1.90	10.09 **	1.85	4.92 ***	2.51	4.66 ***	2.41
Syndicates	0.46 *	-1.62	0.51	-1.39	0.75	-1.43	0.82	-0.89
Fixed effects: Year-Industry					Fixed effects: Year-Industry			
N=2,523					N=2,098			
pseudo R^2= 0.77					pseudo R^2= 0.68			

Table 9: Intangible collateralization, secured and unsecured loans. The dependent variable equals zero if the loan is unsecured, one if the loan is secured by tangibles, and two if the loan includes intangibles as collateral. The base outcome is the probability of taking an unsecured loan. Relative risk ratios reported. Relative risk ratio reports how the relative probability changes relative to the base outcome. Sample size varies in the availability data. G-index, loan size, and loan purpose excluded because the log likelihood does not converge after one thousand iterations. Cluster is at the borrower level. All values of the continuous variables are winsorized at 1% and 99% level. Fixed effects for year and industry (2-digit SIC). Variables are described in Appendix A. ***Significant at 1%, ** 5% and * 10% level, two-tailed tests.

Table 10: Intangible collateralization and information asymmetry: matched sample

Dependent Variable: Collateral_Intangibles			
Variable	**dF/dx**		**p>|z|**
Intangible_Liquidity	0.210	***	0.00
Customers	0.074	***	0.01
Indirect_Competitors	0.024		0.58
Lending_Relationships	0.166	**	0.04
Distance	-0.021	**	0.05
Unregulated_Lead	0.113	*	0.06
Institutional	0.005		0.94
Patents	-0.021		0.22
Trademarks_Copyrights	-0.016		0.30
Intangibles	0.107		0.81
Market-to-Book	0.006		0.78
G-Index	0.003		0.92
Herf_Index	-4.813	***	0.01
Rated	-0.052		0.40
Z_score_beg.	0.005		0.91
Leverage	0.001		0.59
Liquidity	-0.033	*	0.08
Capital Assets	-0.251	*	0.10
ROA	0.210		0.36
Size	-0.001		0.96
Loan_Size	0.013		0.14
Maturity	-0.066	***	0.00
Fin_Covenant	0.022		0.71
Perfprice	-0.098	**	0.05
Syndicates	-0.039		0.13
Fixed effects:			
Year, Industry, Purpose			
	N=		
	705		
	pseudo R^2= 0.18		

Table 10: Intangible collateralization and information asymmetry. The dependent variable is a binary variable that equals one if the loan includes intangibles as loan collateral, and zero if the loan is secured by tangibles. Marginal effects reported. Loans are matched on the loan to value ratio. Cluster is at the borrower level and standard errors are corrected for heteroskedasticity. Variables are winsorized at 1% and 99% level. Fixed effects for year, industry (2-digit SIC), lead lender and loan purpose are included. ***Significant at 1%, ** 5% and * 10% level, two-tailed tests.

Table 11: Intangible collateralization, loan size and LIBOR-spread: Treatment-effects model

	First Stage Test		Second Stage Tests			
Dependent variables:	**Collateral_Intangibles**		**Loan_Size**		**LIBOR-spread**	
Variable	**Coeff.**	**p>|z|**	**Coeff.**	**p>|z|**	**Coeff.**	**p>|z|**
Collateral_Intangibles			**0.149 *****	**0.00**	**67.331 *****	**0.00**
Goodwill			0.047 ***	0.01		
Competitors					15.284 ***	0.00
Intangible_Liquidity	0.346 ***	0.00				
Customers	0.129 ***	0.00				
Lending_Relationships	0.563	0.25	-0.536 ***	0.00	-30.622 ***	0.00
Distance	-0.048 ***	0.01			-1.014	0.17
Unregulated_Lead	0.438 ***	0.00			-7.397	0.31
G-index	-0.063	0.17				
Herf_Index	-11.075 ***	0.00	11.237 ***	0.00	-120.087	0.47
Institutional	0.455	0.14	0.207 ***	0.00	38.639 ***	0.00
Syndicates	-0.007	0.62	0.111 ***	0.00	-1.730 ***	0.01
Rated	-0.040	0.71	0.330 ***	0.00	-2.550	0.64
Fin_Covenant	0.118	0.29	-0.192 ***	0.00	7.591	0.18
Perfprice	-0.049 *	0.10	0.321 ***	0.00	-17.680 ***	0.00
Z_score_beg.	0.033	0.65	0.020	0.62	-0.952	0.80
Leverage	0.038 *	0.08	-0.013	0.29	9.296 ***	0.00
Liquidity	-0.074	0.15	-0.008	0.79	-1.472	0.58
Capital Assets	-0.279	0.34	-0.139	0.39	16.170	0.27
ROA	-0.150	0.65	0.025	0.92	-94.357 ***	0.00
Maturity	-0.029 ***	0.00	-0.122 ***	0.00	4.837 ***	0.02
Loan_Size					1.797	0.11
Size	-0.048	0.11	0.224 ***	0.00	-5.900 ***	0.00
Constant	0.267	0.39	2.931 ***	0.00	188.020 ***	0.00

Fixed effects: Year-Industry-Loan purpose

N= 1,415
Log likelihood= -2163.6

N= 1,415
Log likelihood= -1706.1

rho= -0.28

rho= -0.40

Wald test of independent equations
Prob>chi2= 0.02

Prob>chi2= 0.02

Table 11: Intangible collateralization and information asymmetry (treatment effects). Results of a treatment effect model where the endogenous variable is binary. The first stage test of the effect of using intangibles as collateral on LIBOR-spread includes the size of the loan (untabulated). Cluster is at the borrower level. All values of the continuous variables are winsorized at 1% and 99% level. Fixed effects for year, industry (2-digit SIC) and loan purpose are included. ***Significant at 1%, ** 5% and * 10% level, two-tailed tests.

8. Conclusion

Using a sample of syndicated secured loans in 1996-2005 and data from two field studies, I explore the role of intangible assets in reducing financing frictions in credit markets. Contrary to the predominant managerial and scholarly perspective that intangible assets are not sufficient collateral, I find that twenty-one percent of U.S.-originated secured loans include intangible assets as loan collateral, and the collateralization of intangibles has significantly increased over the last several years. This trend is related to lenders' demand for high yielding assets and changes in markets for intangibles (Figure 1).

I examine four hypotheses to test whether the collateralization of intangibles is an economically valuable market innovation or is driven by lenders' opportunistic behavior in an effort to increase the supply of credit to distressed firms. Consistent with the economically valuable lending decision hypothesis, I hypothesize and find that liquid and redeployable intangibles are likely to be used as collateral. Moreover, I hypothesize and find that borrowers with strong lending relationships will pledge their intangibles as loan collateral. Collateralizing loans by intangibles has significantly increased loan pricing and credit availability. Finally, loans secured by intangibles perform no worse than loans secured by tangibles.

The results provide a broad insight about the collateralization of intangible assets, and have important academic and managerial implications. First, an important point that emerges from the dissertation is that intangible assets increase firm value not only in equity markets, but in credit markets. Under certain conditions, the effective pledgeability of intangible assets has alleviated financing frictions and satisfied lenders' appetite for high yielding assets. Second, while prior literature is inconclusive over the use of intangible assets in loan contracts (Beatty,

Weber and Yu, 2008; Skinner, 2008), I provide evidence that lenders' incentives to collateralize loans by intangibles are related to credit supply. Third, loans secured by intangibles are not worse quality than other secured loans, thus adverse selection and moral hazard inherent in intangibles are not inevitably problematic in securing loans by intangible assets. Finally, I inform the debate on reforming accounting and disclosure practices related to intangibles (e.g., Skinner, 2008) by providing preliminary evidence that credit markets are efficient in finding ways of leveraging and financing intangible assets.

The present study has certain limitations that need to be taken into account when considering its contributions. Due to data limitations, addressing the welfare implications of lending on intangibles is not a goal of this study, thus, I cannot conclude whether lenders and borrowers are rational or better off using intangibles as loan collateral. Future studies could address this research question.

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Appendix A: Variable Definition

Variable	Definition
Bankrupt	Binary variable that equals one if the firm filed for bankruptcy under Chapter 7 or 11, and zero otherwise
Capital Assets	Property, plant and equipment to total assets
Collateral_Intangibles	Binary variable that equals one if intangibles are used as collateral, and zero if the loan is secured by tangible assets
Competitors	The natural logarithm of the number of companies with same 2-digit SIC
Covenant_Violations	The number of covenant violations over the life of the loan from Nini, Smith and Sufi (2009), deflated by loan maturity (in years)
Covenant_Violations2	Binary variable that equals one if a firm violated at least one covenant over the life of the loan, and zero otherwise
Credit_Downgrade2	Binary variable that equals one if borrower's credit rating was downgraded over the life of the loan, and zero otherwise
Credit_Downgrades	The number of downgrades of S&P and Moody's credit ratings over the life of the loan, deflated by loan maturity (in years)
Credit Rating	S&P (or Moody's) credit rating set equal to 1 for AAA (highest rated), and 21 for D rated companies (lowest rated)
Customers	The natural logarithm of the number of borrower's key customers reported in SEC filings
Distance	The natural logarithm of the distance (in miles) between the capital cities of the states where firm's and its lead lender's headquarters are located
Fin_Covenant	Binary variable that equals one if the loan includes a financial and/or (tangible) net worth covenant, and zero otherwise
G-Index	Governance index defined in Gompers et al. (2003)
Goodwill	Goodwill to total assets
Herf_Index	Firm's sales to industry sales (based on Fama-French 48 industry portfolios)
Indirect_Competitors	The natural logarithm of the number of firms that are classified in borrower's secondary, but not primary industry (2-digit SIC)
Institutional	Binary variable that equals one if the loan includes tranches sold to institutional investors (Term Loan B-H), and zero otherwise
Intangibles	Other intangibles, R&D and advertising expenses, deflated by total assets

Variable	Definition
Intangible_Liquidity	Binary variable that equals one if the firm licenses its intangible assets to third parties, and zero otherwise
Lending_Relationships	The size of loans that a borrower raised from a lead lender in the last five years prior to loan origination, deflated by the total loan size raised in this period
Leverage	Total debt to equity
LIBOR-spread	The coupon spread over LIBOR on the drawn amount plus the annual fee
Liquidity	Current assets to current liabilities
Loan_Size	The natural logarithm of loan amount (in $m)
Loanamt_Assets	Loan amount to total assets
Market-to-Book	Market value to book value of equity
Maturity	The natural logarithm of loan maturity (in months)
Patents	The natural logarithm of borrower's patents at the time of loan origination
Perfprice	Binary variable that equals one if the loan includes a performance increasing or decreasing term, and zero otherwise
Rated	Binary variable that equals one if the borrower is rated by S&P or Moody's, and zero otherwise
ROA	Operating income to total assets
Size	The natural logarithm of total assets
Syndicates	Number of co-syndicates
Trademarks_Copyrights	The natural logarithm of the number of active trademarks and copyrights at the time of loan origination
Unregulated_Lead	Binary variable that equals one if the lead lender is an investment bank, an insurance firm or a finance company, and zero otherwise
Z-Score	The number of years that borrower's z-score fell below 0.3 (i.e. lowest 20% of public firms in 1996-2010), deflated by loan maturity (in years)
Z_Score_beg.	Borrower's z-score at the time of loan origination
Z-Score2	Binary variable that equals one if borrower's z-score fell below 0.3 over the life of the loan, and zero otherwise

Appendix B: Examples of loan contracts secured by intangibles

Company	Date	Abstract from 8-K Filings
UNIVISION COMMUNICATIONS	September 1996	"(Collateral includes)… **trade secrets, computer programs, software, customer lists, trademarks, trade names, patents, licenses, copyrights, technology, processes, proprietary information** and insurance proceeds, including, without limitation, **the Copyrights, the Patents, the Marks and the Programs, and the goodwill of Grantor's business connected with and symbolized by the Marks**"
US PLASTIC LUMBER CORP.	September 1998	"(Collateral includes)… **inventions, designs, drawings, blueprints, patents, patent applications, trademarks and the goodwill of the business symbolized thereby, names, trade names, trade secrets, goodwill, copyrights, registrations, licenses, franchises, customer lists,** security and other deposits, rights in all litigation presently or hereafter pending for any cause or claim (whether in contract, tort or otherwise), and all judgments now or hereafter arising therefrom"
HASBRO INC.	March 2002	"**U.S. trademarks… U.S. copyrights… and U.S. patents and U.S. patent Applications**…in each case relating exclusively to the Identified Brands"
HUFFY CORP.	January 2000	"Intellectual Property (pledged as collateral) shall mean… Borrower's now owned and hereafter arising or acquired: **patents, patent rights, patent applications, copyrights, works which are the subject matter of copyrights, copyright registrations, trademarks, trade names, trade styles, trademark and service mark applications…** all rights to sue for past, present and future infringement of any of the foregoing; inventions, trade secrets, formulae, processes, drawings, designs, blueprints, goodwill, customer and trade secret rights, copyright rights, rights in works of authorship…"

TRADEMARK SECURITY AGREEMENT
(Savvis Communications International, Inc.)

THIS TRADEMARK SECURITY AGREEMENT ("Agreement") is between Savvis Communications International, Inc., a Delaware corporation ("Debtor"), and General Electric Capital Corporation, a Delaware corporation, as Agent ("Secured Party") dated as of March 8, 2002…

R E C I T A L S:

A. Debtor and Secured Party have entered into that certain Security Agreement dated as of March 18, 2002 (as the same may be amended, modified, supplemented, renewed, extended or restated from time to time, the "Security Agreement"; all terms defined in the Security Agreement, wherever used herein, shall have the same meanings herein as are prescribed by the Security Agreement).

B. Pursuant to the terms of the Security Agreement, Debtor has granted to Secured Party a lien and security interest in all General Intangibles of Debtor, including, without limitation, all of Debtor's right, title, and interest in, to and under all now owned and hereafter acquired Trademarks, together with the goodwill of the business symbolized by Debtor's Trademarks, and Trademark Licenses, and all products and Proceeds thereof, to secure the payment of the Obligations.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Debtor hereby grants to Secured Party a lien and continuing security interest in all of Debtor's right, title, and interest in, to, and under the following (all of the following items or types of Property being herein collectively referred to as the "Trademark Collateral"), whether presently existing or hereafter created or acquired…

(1) each Trademark, trademark registration ("Trademark Registration") and trademark application ("Trademark Application"), including, without limitation, each Trademark, Trademark Registration and Trademark Application referred to in Schedule 1 annexed hereto, together with the goodwill of the business symbolized thereby; and

(2) each Trademark License, including, without limitation, each Trademark License listed in Schedule 1 annexed hereto; and

(3) all products and proceeds of the foregoing, including, without limitation, any claim by Debtor against third parties for past, present or future (a) infringement, dilution or breach of any Trademark, Trademark Registration, Trademark Application and Trademark License, including, without limitation, any Trademark, Trademark Registration and Trademark License referred to in Schedule 1 annexed hereto, and any Trademark Registration issued pursuant to a Trademark Application referred to in Schedule 1 annexed hereto; or (b) injury to the goodwill associated with any Trademark, Trademark Registration and Trademark Application.

The lien and security interest contained in this Agreement is granted in conjunction with the liens and security interests granted to Secured Party pursuant to the Security Agreement.

Debtor hereby acknowledges and affirms that the rights and remedies of Secured Party with respect to the liens and security interests in the Trademark Collateral made and granted hereby are more fully set forth in the Security Agreement, the terms and provisions of which are incorporated by reference herein as if fully set forth herein.

IN WITNESS WHEREOF, Debtor has caused this Agreement to be duly executed by its duly authorized officer as of the date written above.

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