Topics in Corporate Finance

The Role of Bank Funding for the Corporate Sector: the Netherlands in an International Perspective

Anthony Saunders
Anjolein Schmeits

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Preface

A key public policy issue is whether corporates have smooth access to outside finance. Of particular relevance are bank loans, the primary source of outside finance for corporations in Continental Europe.

To shed light on this important issue, the Amsterdam Center for Corporate Finance (ACCF) and the Ministry of Economic Affairs jointly commissioned a study on 'The Role of Bank Funding for the Corporate Sector: the Netherlands in an International Perspective'. Professor Anthony Saunders, the John M. Schiff Professor of Banking and Finance at the Stern School of Business of New York University, together with Dr. Anjolein Schmeits, assistant professor at Washington University in St. Louis, have undertaken the study. This publication by the ACCF reports their findings.

While Saunders and Schmeits are not negative about the efficiency of the Dutch financial sector in general, they do point at some frictions in the provision of credit, particularly for small and medium-sized businesses. Several other findings are reported, contrasting the Netherlands with other European countries and the US.

We hope that you enjoy reading it, and that this publication contributes to a constructive debate on the efficiency of the Dutch financial sector.

A.W.A. Boot
J.E. Ligterink
January, 2002

The Role of Bank Funding for the Corporate Sector: the Netherlands in an International Perspective

Contents

Preface v

Executive summary ix

1 The Role of Bank Leverage for the Corporate Sector: the Netherlands in an International Perspective 1
- 1.1 Introduction 1
- 1.2 The Relative Importance of Financial Markets and Bank Financing in the US, the UK, Germany and the Netherlands 3
- 1.3 An International Comparison of the Capital Structures of Non-Financial Firms 5
  - 1.3.1 A Comparison of Summary Balance Sheets 5
  - 1.3.2 A Comparison of Leverage Ratios 6
  - 1.3.3 Summary of Capital Structure and Balance Sheet Comparisons 11
- 1.4 An Overview of Other Institutional Factors that May Impact Leverage 12
  - 1.4.1 Leverage and Taxation 13
  - 1.4.2 Leverage and Bankruptcy Laws 13
  - 1.4.3 Corporate Governance and Leverage 14
- 1.5 Cross-Sectional Tests Regarding the Determinants of Firm Leverage 15
- 1.6 Summary and Conclusions 17
- Tables 19
- Figures 32
- Appendix 48

2 The Capital Structure and Funding Source Choices of Small and Large Firms in the Netherlands 57
- 2.1 Introduction 57
- 2.2 The Capital Structure of Publicly Traded Firms 58
- 2.3 The Capital Structure of Private Firms 59
  - 2.3.1 Private Firms with 10-50 Employees 60
  - 2.3.2 Private Firms with 50-100 Employees 61
- 2.4 Life Cycle Effects in the Capital Structures of Publicly Traded and Private Firms 62
- 2.5 The Funding Sources of Dutch Corporations: A Supply Perspective 64
- 2.6 Summary and Conclusions 66
- Tables 68

3 The Determination of Bank Lending Rates: Evidence for the Netherlands and Other Countries 89
3.1 Introduction 89
3.2 The Prime Rate and Its Correlation with Market Interest Rates and Across Countries 90
3.3 An International Comparison of the Size and Determinants of the Bank Spread 92
3.4 An International Comparison of the Sensitivity of Bank Lending Rates to Changes in Banks' Cost of Funds 94
3.5 Summary and Conclusions 96
Tables 98
Figures 128

4 Loan Pricing, Collateral and Covenants: The Dutch and Other Countries' Experience 131
4.1 Introduction 131
4.2 The Cost and Availability of Credit in the Dutch Loan Market 132
4.2.1 Overall Market 132
4.2.2 Loan Pricing 133
4.2.3 Collateral 135
4.2.4 Loan Covenants 137
4.2.5 Credit Availability 137
4.3 The Cost and Availability of Credit in the UK Loan Market 139
4.3.1 Overall Market 139
4.3.2 Loan Pricing 140
4.3.3 Collateral 141
4.3.4 Credit Availability 142
4.4 The Cost and Availability of Credit in the US Loan Market 142
4.4.1 Overall Market 143
4.4.2 Loan Pricing 144
4.4.3 Collateral 146
4.4.4 Covenants 148
4.4.5 Credit Availability 148
4.5 The Cost and Availability of Credit in the German Loan Market 149
4.5.1 Overall Market 149
4.5.2 Loan Pricing 151
4.5.3 Collateral 151
4.5.4 Credit Availability 152
4.6 Summary and Conclusions 152
Tables 154
Figures 161

References 162

Note on the Contributors 176

Executive Summary

1. Introduction and Objectives

This executive summary presents the results of a study on the effectiveness and availability of bank financing in the Netherlands, initiated by the ACCF and the Dutch Ministry of Economic Affairs. The main objective of the study was to *examine the role and importance of bank financing in the Netherlands, within the broader context of the capital structure and funding source decisions of Dutch non-financial firms.*

The study documents the financing behavior of publicly traded and private non-financial firms in the Netherlands, with a particular emphasis on the financing decisions and financing barriers facing small firms. The financing choices of Dutch firms are also examined in an international context, in order to draw comparisons between the Netherlands and three other countries (Germany, the US and the UK) regarding: (*i*) the relevance of banks and financial markets in the provision of financing to the corporate sector; (*ii*) the leverage choices, i.e., the financial structure of corporations; and (*iii*) the contractual mechanisms that affect the cost (and other contractual features) of bank financing, including the size of the intermediation spread, the credit risk premium (credit spread), collateral requirements and loan covenants, and their link to the bankruptcy rules and the competitiveness of the banking sector in each country.

2. Main Conclusions and Policy Implications

Since data availability is limited, care should be taken in drawing conclusions. Nevertheless, some important conclusions emerge. First, the study tentatively points at shortcomings in the provision of funding to small and medium-sized firms in the Netherlands, in terms of maturity, price and availability of credit. There appears to be an overdependence on short-term debt, in particular trade finance, possibly because longer term bank debt financing is too expensive for these firms. Given the unlikely appearance of major new entrants and, if anything, greater consolidation in the future, what can be done? Clearly, Dutch banks need greater incentives – especially in a world of RAROC pricing linked to credit ratings, and where collateral is viewed as paramount – to provide credit to firms outside of the largest group. One possibility is an extension (and revitalization) of the BMKB scheme (state loan guarantee scheme). According to the Ministry of Economic Affairs only 3% of bank loans to smaller firms are covered by such guarantees. This scheme might be extended and expanded, but design issues in these guarantees should be carefully addressed. Blatant guarantees are undesirable. In this context, one could also think of industry arrangements (possibly in conjunction with the Kamers van Koophandel) that support small businesses in obtaining outside finance. In particular, a greater standardization and transparency in the loan application process could improve access to bank loans.

Second might be more avert moves by the government to encourage the growth of

bank loan alternatives. On an international comparative basis, trade credit is already a substantial proportion of large and small firm debt finance. However, market sources of funds, such as commercial paper and corporate bonds, are notably absent. This is odd because of the existence of large-sized investment vehicles in the Netherlands, who well may be interested in these instruments under appropriate tax conditions. Indeed, the emergence of the Euro has greatly expanded the potential market (and liquidity) of corporate debt issues in the EU (e.g. the recent emergence of a sizable junk bond market for European corporate debt). Additional measures to attract investors and to expand investor demand might be considered, especially in the tax treatment of debt for both issuers and investors in the corporate debt market.

Third, banks might be encouraged to securitize their bank loans (especially guaranteed small business loans). In the US, a limited number of SBA securitized loan packages have been tried, and increasingly CLOs (Collateralized Loan Obligations) containing diversified bond portfolios that (asset) back bond issues are currently being employed. Such devices make loans (and small business loans in particular) more attractive for banks to originate, since origination and servicing fees can be generated, while transferring risk to the outside market (investors).

On a different note, this study also points at weaknesses in the monitoring of the efficiency and competitiveness of the financial sector. Micro-data at the individual firm level which decompose debt into its bank loan, trade finance, corporate bond etc. components are simply unavailable, either on an individual country or on a cross-country basis. While there is a growing interest of public authorities in financial sector efficiency issues, see recent work commissioned by the CPB (2001) and the NMa (2000), little effort has been made in seriously collecting relevant data. This suggests an immediate need for a cooperative project (perhaps sponsored by the EU or the OECD) to collect a standardized micro-level database that will allow policy conclusions and recommendations to be placed on a firmer basis.

3. Overview of the Study

This study is comprised of four interlinked chapters: (1) 'The Role of Bank Leverage in the Corporate Sector: the Netherlands in an International Perspective'; (2) 'The Capital Structure and Funding Source Choices of Small and Large Firms in the Netherlands'; (3) 'The Determination of Bank Lending Rates: Evidence for the Netherlands and Other Countries'; and (4) 'Loan Pricing, Collateral and Covenants: The Dutch and Other Countries' Experience'.

The first two chapters address the capital structure and funding source choices of Dutch non-financial firms. In our analysis, we rely on aggregate information with respect to both the leverage ratios of firms and the relative importance of banks and securities markets (bond and equity markets) as funding sources for non-financial firms.[1]

1 Of great interest would also be an analysis of the financing behavior of these firms at the 'micro-level' of the individual firm, but lack of data availability does not allow us to perform such an analysis.

In *Chapter 1*, we analyze the leverage choices of publicly traded firms that are part of the stock market index in the Netherlands, Germany, the US and the UK during the period 1989-1998. We present aggregate leverage ratios as well as breakdowns of these ratios along two dimensions: asset size (in order to examine the relation between leverage and firm size), and debt maturity (in order to gain a better understanding about the composition of debt). We also examine partial correlations between leverage and factors such as firm size, firm profitability and tangibility of firm assets for cross-sections of firms in the four countries. Since previous international capital structure comparisons did not include the Netherlands, this exercise is valuable, since it provides 'stylized facts' regarding the capital structures of Dutch listed firms relative to those in other countries. Chapter 1 also includes data on the role of banks and financial markets in the provision of financing to firms in the different countries (and on some other institutional factors, such as taxation, bankruptcy law and governance mechanisms), and thus provides a useful institutional framework for the remainder of the study.

While Chapter 1 concentrates on the leverage choices of larger – indeed the very largest – Dutch listed firms, *Chapter 2* documents the capital structure and funding source choices of a broader spectrum of Dutch firms, including small and medium-sized private firms. We analyze the leverage ratios of both publicly traded and private non-financial firms in the Netherlands during the period 1992-1999. The private firms in our sample are classified in two groups, based on their number of employees: (*i*) firms with 10-50 employees (the smaller private firms), and (*ii*) firms with 50-100 employees (the larger private firms, or medium-sized firms). This allows us to put extra emphasis on the financing behavior (and potential financing barriers) of small firms in the Netherlands. Analogous to Chapter 1, we include breakdowns of leverage ratios based on asset size and debt maturity for all groups of firms. We also report life cycle effects in order to examine (changes in) firms' leverage and funding source choices at different stages in their life, measured since their date of incorporation respectively their date of listing.

In the third and fourth chapter, we shift our focus to the contractual mechanisms underlying the terms of bank financing in the Netherlands, Germany, the US and the UK. We examine the pricing features of bank loan contracts (i.e., the bank lending rate) as well as more implicit contractual features that affect the cost and availability of bank loans to borrowers, such as collateral requirements and loan covenants. Although an analysis of the terms of bank loans is particularly interesting at the level of individual firms, data on individual loan contracts unfortunately are not available. However, the use of data on bank prime (base) lending rates and existing empirical evidence from the international banking and small business financing literature allow us to develop insights in the contract terms of bank loans in the different countries, and to link them to (differences in) bankruptcy rules and/or the competitiveness of the banking industry.

In *Chapter 3*, we focus on loan pricing and examine the determination of the bank prime rate in the Netherlands, Germany, the US and the UK. The prime rate is the lending rate on which banks base the interest rate they ultimately charge borrowers, and which compensates banks for their underlying funding costs and intermediation ser-

vices. Since this rate does not include the credit risk premium charged to individual borrowers (i.e., the credit spread), it does not reflect any differences in borrower credit risk between countries, and thus is useful for international comparison. We report the correlation between bank rates and government bond rates within and across countries during the period 1986-1998. In addition, we estimate the cost of intermediation in each of the four countries by comparing the relative size and determinants of the bank spreads or intermediation spreads (i.e., the margins of the bank prime rate over banks' cost of funds). This analysis allows us to draw inferences with respect to differences across countries in the volatility of funding costs for banks, the costs of regulation and regulatory compliance, and the competitive structure of the banking industry. Finally, we examine the sensitivity of changes in the bank prime rate to changes in the underlying cost of funds for each of the four countries in order to analyze whether bank prime rates are sticky, and whether they respond differently to cost of fund increases and decreases.

In *Chapter 4*, we present empirical evidence on the determination of the credit spread (i.e., the credit risk premium that banks charge individual borrowers as a compensation for their default risk), collateral requirements, loan covenants, loan maturity and the availability of credit to small and medium-sized firms for the Netherlands, the UK, the US and Germany. For the UK, the US and Germany, this evidence is obtained from empirical research based on small business surveys. For the Netherlands, we predominantly draw on interviews with bank loan officers. For each country, we furthermore discuss the overall bank loan (credit) market and the lending process. Our findings on the various contractual and availability features of bank credit are finally linked to the design of bankruptcy laws and other relevant aspects of the competitive and regulatory environment in the four countries.

4. Overview of Findings

Chapter 1: The Role of Bank Leverage in the Corporate Sector: the Netherlands in an International Perspective

In this chapter, we employed the Global Vantage database to examine the aggregate capital structures of larger listed non-financial firms in the Netherlands, Germany, the US and the UK during the period 1989-1998 (in particular, in the year 1997), including breakdowns based on asset size and debt maturity. In addition, we use aggregate bond and stock market statistics to document the relative depth of financial market financing and bank financing in these countries.

Our findings in this chapter point at a small significance of the corporate bond market for the financing of non-financial firms in the Netherlands, Germany and the UK. The amount of corporate debt financing (narrowly defined to exclude working-capital related items, such as accounts payable and other liabilities) in these countries closely approximates the amount of private debt financing (including bank financing), in particular for smaller firms. Among the four countries analyzed in our study, only the market-dominated financial system of the US has a substantial corporate bond (and equity) market (measured as a percentage of GDP). In the UK, both the depth of equity financ-

ing and bank financing are large. Germany and the Netherlands, on the other hand, can be classified more as bank or 'depository institution'-dominated financial systems, with a small role of both equity and corporate bond markets.

Nevertheless, while a small group of universal banks play a central role in both the German and Dutch banking systems, there are still some significant differences among these systems that need to be mentioned. For example, the big three German banks control less than 10% of the German deposit base, and there are a large number of small banks (2,500). In addition, state-controlled banks (in particular, the Landesbank and Sparkassen) control around 50% of the market. Thus, the German banking market is less concentrated and more geographically diverse than the Dutch market. As such, it is of interest not only to compare the behavior of the US and the UK banking systems relative to the Dutch banking system in providing debt finance, but to include a comparison with Germany as well (see also Chapter 4).

With respect to the leverage choices of non-financial listed firms, we found that, overall, the leverage ratios (and in particular, the debt ratios) of Dutch corporations appear to be quite similar to those in Germany and the US, but higher than those in the UK, and are (weakly) positively correlated with firm size (measured in terms of the book value of assets). In particular, dividing firms into asset quartiles appears to show higher leverage among the largest quartiles of Dutch firms, although more sensitive cross-sectional regression tests suggest that this relationship is not very strong in terms of statistical significance. In comparison with Germany, the very largest firms in the Netherlands appear to have higher debt ratios than similar German firms. The latter observation is remarkable, and may suggest the existence of some degree of market power on the side of German banks. We also found that, similar to the UK, Dutch firms rely more heavily on short-term financing than either German or US firms, and that the smallest firms in the Netherlands and the UK use low amounts of long-term debt financing relative to the smallest firms in Germany and the US.

This reliance on short-term finance by small Dutch firms (especially compared to larger firms) is interesting in view of the fact that DNB statistics for 2000 suggest that 54% of bank loans to non-financial firms had a maturity of more than 5 years, 10% had a maturity of 1 to 5 years, and 36% had a maturity of less than 1 year (i.e., were short-term). Reconciling these data suggests that bank loans must be predominantly extended to larger firms (see also Chapter 4) with smaller firms relying more on trade finance (which is very large in the Netherlands according to the Global Vantage data base) and other non-depository institutional sources of short-term debt.

Furthermore, a cross-sectional analysis of the sensitivity of the debt ratios of non-financial listed firms in the four countries to firm size, firm profitability, and the tangibility of firm assets, indicates that there exists a highly sensitive inverse relationship between the profitability of Dutch firms and their debt ratios (this sensitivity was in the order of two times larger than that in other countries). Such a finding is consistent with Dutch firms considering the cost of external debt (bank) financing relatively high, and thus seeking to substitute external debt financing with internally generated funds (retained earnings)

where possible. Finally, we found that the effect of asset tangibility (i.e., the presence of collateralizable assets) on the debt ratios of firms in the Netherlands, Germany, the US and the UK was significantly positive, and interestingly, appeared to be similar in magnitude for all countries, despite significant differences in bankruptcy laws.

Chapter 2: The Capital Structure and Funding Source Choices of Small and Large Firms in the Netherlands

In this chapter, we used the Reach database to examine the leverage ratios of publicly traded and private non-financial firms in the Netherlands during the period 1992-1999, with a particular emphasis on smaller firms. Private firms were grouped into two subsets, based on their number of employees: (i) firms with 10-50 employees (smaller private firms) and (ii) firms with 50-100 employees (larger private firms, or medium-sized firms). The chapter includes breakdowns of leverage ratios based on asset size, debt maturity and the stage in the firm's life cycle since the date of incorporation and/or listing.

In general, the firms analyzed by the Reach database are smaller than those analyzed by Global Vantage. Nevertheless, despite the differences in sample, the leverage results are quite similar, in that larger firms tend to have higher leverage ratios than smaller firms, although the differences between the largest and the smallest quartiles are quite small (see also Chapter 1). Interestingly, listed Dutch firms have significantly lower debt ratios than both groups of private firms (with the debt ratios of smaller private firms exceeding those of larger private firms). For all firms, large and small, the debt structure is dominated by short-term debt. For both publicly traded and private firms, furthermore, larger firms use more long-term debt than smaller firms. This is consistent with larger firms having greater access to bank loan finance. Moreover, during the last five years both the overall leverage ratios and – to an even larger extent – the long-term debt ratios have dropped for the smallest of the smaller private firms. This suggests that these firms have a limited access to longer-term bank financing, and/or view the cost of bank financing as being too high.

With respect to the life cycle effects, we found that for both listed and private firms the leverage ratios for the youngest firms (i.e., firms with a maturity of 10 years or less since their date of incorporation) are significantly higher than those of more mature firms. Interestingly, however, the debt ratios of both the youngest of the smaller private firms and the youngest listed firms (measured since their date of incorporation) appear to have fallen in the period 1995-1999. This could possibly be a reflection of the structural shift in the economy towards new technology firms. Since these firms have less predictable cash flows and asset values, banks may be less willing to finance such companies than 'traditional' small firms. A further interesting finding is that the leverage ratios of the most long-lived larger private firms (i.e., firms with a maturity since incorporation larger than 30 years) are quite similar to those of the publicly traded companies. This may imply that these firms are not equity constrained, and that the decision not to obtain financing in the capital market may reflect owner choice rather than the presence of institutional and size barriers to entry.

Chapter 3: The Determination of Bank Lending Rates: Evidence for the Netherlands and Other Countries

This chapter focuses on the determination of the prime (base) bank lending rate in the Netherlands, Germany, the US and the UK. Using monthly Datastream data on bank and market interest rates for the period 1986-1998, we examined: (i) the correlation or co-movement between bank and market-determined interest rates within and across countries; (ii) The relative size and determinants of intermediation spreads (i.e., the margin of the prime rate over banks' underlying cost of funds) in the different countries; and (iii) the sensitivity of prime rate changes to changes in the banks' cost of funds (i.e., the 'stickiness' of interest rates over time).

Our first major finding is that, compared to government bond rates that have high positive correlations over the period 1986-1998, the correlations between bank loan rates are much weaker. Indeed, while the correlation coefficient between the prime rate in the Netherlands and the base loan rate in Germany is high (0.94), its correlation with the prime rate in the UK is lower (0.60), whereas that with the prime rate in the US is actually negative (-0.08). This suggests that bank loan rates, as administered rates, are much more sensitive to domestic conditions and institutional features of the financial system than bond rates and bond markets, which seem to be more integrated.

With respect to the spread of the bank prime rate over the underlying cost of funds (the bank spread or intermediation spread), we found that the size of the spread in the UK during the period 1986-1998 was significantly lower (i.e., less than half the size) than that in other countries. The intermediation spreads in the US and Germany were the highest, while the bank spread in the Netherlands was slightly lower than that in the US and Germany, but larger than that in the UK. The high spreads in the US can be explained in part by the fractured and localized nature of much of its domestic banking system, due to restrictions on inter-state banking and other bank activities that have existed until very recently. The low spreads in the UK seem to reflect the role of London as the center of the international banking system and the competitive structure of the UK banking industry.

The finding of low intermediation spreads for the UK might lead one to suspect that UK firms might have higher (rather than lower) leverage ratios than other countries. However, as discussed in chapter 4, the UK banks appear to charge relatively high credit spreads (e.g., compared to the US), and also have relatively creditor friendly bankruptcy laws. It may well be that these costs mitigate the intermediation efficiencies of UK banks.

With respect to the sensitivity of bank prime rate changes to underlying changes in banks' cost of funds (i.e., the 'stickiness' of bank loan rates), our main finding was that during the period 1986-1998 the US prime rate and the German prime rate were the least sensitive (i.e., most sticky), and the UK prime rate the most sensitive. The US and German prime rates also demonstrated the largest degree of asymmetry in prime rate responses to cost of fund increases versus decreases (with a higher sensitivity in upward direction). Both in terms of the relative size and in terms of the degree of asymmetry in prime rate responses to cost of funds changes, the sensitivity of the Dutch prime rate lies between that in the US and Germany on the one hand, and the UK on the other hand.

The stickiness of bank loan rates may reflect either one or both of the following factors: (a) a degree of collusion or cartelization in setting and changing prime lending rates (and thus a less competitive credit market); and/or (b) the willingness of banks to 'smooth' interest rates changes over time. While the former might be viewed as harmful to customers, the latter might be beneficial (with banks partially absorbing underlying interest rate shocks as part of their overall 'relationship' with borrowing firms). Our results appear to be consistent with a high level of intermediation efficiency in the UK, especially when compared to the US and Germany. The Netherlands takes an intermediate position.

Chapter 4: Loan Pricing, Collateral and Covenants: The Dutch and Other Countries' Experience

This chapter summarizes and compares the cost and availability features of borrowing in the Netherlands, the UK, the US and Germany, drawing on empirical evidence. We examined differences in the determination of the credit spread (i.e., the spread over the banks' intermediation spread), collateral requirements, credit availability and other contractual features for small and medium-sized business loans in the different countries. Our analysis furthermore includes an overview of the (competitive) structure of the bank loan market in each country, as well as a discussion of the relevant aspects of bankruptcy law and other aspects of the competitive and regulatory environment that may have an impact on the contract terms of bank loans. Evidence for the Netherlands was obtained by interviews with bank loan officers and account managers.

Our findings suggest that spreads in bank loan rates (i.e., both intermediation spreads and credit spreads), as well as collateral requirements appear to differ substantially across countries. Focusing on the Netherlands, we found that credit spreads appear to be relatively high, collateral requirements relatively high and domestic loan maturities relatively low (see also Chapter 1), in comparison to the UK, the US and Germany. However, the credit spreads in the Dutch loan market are increasingly reflecting the perceived riskiness of borrowers generated from banks' own credit-scoring models, credit rating systems and RAROC models. That is, the credit spreads reflect the qualitative judgments of lending officers and lending committees less often, even for small borrowers.

Our international comparison indicates that a trend towards an increased quantification of credit spreads for the smallest borrowers is to be found in all four countries analyzed. Furthermore, we conclude that the collateral requirements and maturity structure of loans in the different countries cannot be viewed independently of the bankruptcy laws and in particular priority rules for creditors in each of these countries. For example, the US bankruptcy law is quite debtor friendly. As a result creditors appear to place more emphasis on loan pricing and maturity than on collateral. In the UK, Germany and the Netherlands, on the other hand, bankruptcy laws are relatively more creditor friendly (although various uncertainties still remain in these countries regarding the priority of bank claims on certain types of collateral upon bankruptcy) and collateral plays a more central role.

Finally, even in the UK, where the availability of bank financing to small businesses appear to be relatively unconstrained, concerns were explicitly raised about the high costs of money transmission/payment services and the low interest payments on small business checking accounts. Similar concerns may play a role for Germany. This suggests that focusing on even four or five key contractual features of small business loans may not provide a full picture of the overall cost and availability of small business finance in the different countries. That is, the whole portfolio of services emanating from the relationship between banks and firms and their respective costs needs to be examined.

The Role of Bank Funding for the Corporate Sector: the Netherlands in an International Perspective

1 The Role of Bank Leverage for the Corporate Sector: the Netherlands in an International Perspective*

1.1 Introduction

In recent years, a large number of academic and policy-oriented studies have attempted to increase our understanding of the main determinants of firms' choices of capital structure, their cost of capital, and the role of different financing sources in the provision of financing to firms, both in a national and an international perspective.[1] Although these studies have provided some valuable insights in the financing behavior of corporations in different countries, inter-country comparisons were generally constrained by the absence of consistent databases and measurement problems. In addition, international comparisons were mainly focused on the world's largest economies (in terms of GDP), and thus did not include the Netherlands. As a consequence, very little is known about how the capital structure choices of Dutch firms differ from those of firms in other major economies, and how the relative importance of bank and financial market financing in the Netherlands compares internationally.

In this chapter, we try to fill this gap and establish recent stylized facts regarding the capital structure (leverage) decisions of Dutch firms relative to those in three other economies: the US, the UK and Germany. We also attempt to shed some light on the relative importance of the bond and equity market and bank financing in these countries. Our analysis complements and updates a recent study by Rajan and Zingales (1995), which analyzes the financing decisions of listed non-financial firms in the major industrialized (G-7) countries during the period 1987-1991, with a particular emphasis on the year 1991. Not only was 1991 a recession year, and now 10 years ago, updating this information is also useful given the significant changes that since then have occurred in the financial markets and banking sectors, and – more generally – the economic and political systems, in both the US and Europe.

Analogous to Rajan and Zingales (1995), we employ the Global Vantage database, which contains standardized accounting and monthly stock price information of all publicly traded companies that are present in the Morgan Stanley Capital International

* We thank Lei Yu for valuable research assistance.

1 Examples in the recent finance literature are Kester (1986), Mayer (1988), Borio (1990), McCauley and Zimmer (1994), Demirgüc-Kunt and Macsimovic (1996), and Rajan and Zingales (1995). An overview of these studies can be found in Boot, Ligterink and Schmeits (1997). Examples of policy-oriented publications are the 'Final Report for Study on International Differences in the Cost of Capital for the European Commission' by Coopers and Lybrand (1993), the 'Toets op het Concurrentievermogen' by the Dutch Ministry of Economic Affairs (1995), and, recently, the 'Banken notitie: Kredietverlening van banken', by Janssen (2000). The last study compares the importance of bank financing and other financing sources in the Netherlands with that of other countries, and in particular provides new and interesting insights into the allocation of credit within the Netherlands.

Index, the Financial Times Actuaries World Index or the local stock market indices.[2] The Global Vantage database has increasingly been used for international corporate finance comparisons, since it attempts to harmonize accounting ratios (and inherently, the financial statement implications of firms' financial decisions). Although not all accounting differences are eliminated, especially those with respect to leases and pension liability reporting, the Global Vantage database is the closest approximation to a set of standardized accounting information across countries that is currently available. Observe that the Global Vantage database only covers publicly traded firms (i.e., firms that are listed at the local stock exchanges of the different countries), and predominantly contains book value information.[3] Observe also that the accounting information in the Global Vantage database does not allow us to break down a firm's debt and equity into bank debt versus bond financing on the one hand, and retained earnings and stock issues on the other hand.[4]

We compare the data for the Dutch corporate sector to the most recent data of three G-7 countries: the US, the UK and Germany. These countries have been selected because they represent different financial systems. The US and the UK are considered market-dominated economies, in which bank financing is relatively less important, whereas the Netherlands and Germany are viewed as bank-dominated economies, with a predominant role of universal banks in the financing of firms (see also Mayer, 1988). Of particular interest in this respect will be the comparison between the Netherlands and Germany, since both countries have a relatively underdeveloped (corporate) bond market, and a banking sector dominated by a few large banks.[5] Germany and the UK are furthermore important European 'benchmark' economies for the Netherlands.

In order to document the capital structure choices of the firms in our analysis, we will compare different measures of leverage for all countries for the year 1997, the most recent year for which complete information from the Global Vantage database is available.[6] Because of different approaches to defining leverage, nine alternative measures of leverage are calculated. We decompose the aggregate leverage ratios into short-term and long-term ratios, and examine whether there are any material differences in debt maturity structures between the countries. In addition, we report the time series behavior of these leverage measures over a full business cycle for the period 1989-1998 in a number

2 For the US, the UK, Germany and the Netherlands the local indices are the S&P 500 Index, the FT Actuaries 500, the FAZ Share Index, and the AEX Index respectively. The use of firms that are part of the local index increases the comparability of our aggregate capital structure figures, since (in general) the most important industries in an economy are incorporated in this index, and these industries are fairly similar for the different countries (although there may be some small differences in 'industry representation' between countries).

3 The capital structure choices of private Dutch corporations will be documented in Chapter 2. In that chapter, we will analyze the capital structure and funding source decisions of both publicly traded and private non-financial firms in more detail, and further examine the role of banks, bond and stock markets, and other capital suppliers for the provision of financing in the Netherlands. Although the Global Vantage database contains (limited) market value information, we focus on book value information in this chapter in order to facilitate capital structure comparisons between publicly listed and private firms later on.

4 However, our comparison of the financial systems in the different countries in Section 1.2 of this chapter will shed some light on the relevance of different funding sources, and thus on the composition of debt and equity used by non-financial firms.

5 See also Chapter 4 of this study.

6 We present limited (incomplete) data and results for 1998 in a separate Appendix to this chapter.

of graphs. We finally analyze partial correlations between leverage and factors such as firm size, firm profitability and tangibility of firm assets for cross-sections of firms in the four countries.

Although the countries in our analysis are fairly homogeneous in their level of economic development, their institutions – as exemplified by the tax and bankruptcy code, corporate governance mechanisms, and by the historical role played by banks and financial markets – are quite different. We therefore briefly review these institutions, and discuss their likely impact on firms' financing decisions in the different countries. This will provide an institutional context for our findings regarding the financing choices of firms in this chapter, and in the following three chapters of this study (see also Rajan and Zingales, 1995).

The organization of this chapter is as follows. Section 1.2 provides evidence on the relative depth of the bond and stock markets in the US, the UK, Germany and the Netherlands, and on the role of bank financing in the respective countries. In Section 1.3, we present summary balance sheet and ratio comparisons for all firms in each of the four countries. In Section 1.4, we discuss differences in institutions, such as taxation, bankruptcy laws and corporate governance. Section 1.5 presents the results of cross-sectional tests regarding the determinants of leverage for the different countries. Section 1.6 concludes.

1.2 The Relative Importance of Financial Markets and Bank Financing in the US, the UK, Germany and the Netherlands

As discussed in the Introduction, the US and the UK have historically been viewed as market-oriented financial systems, with a dominant role for securities markets in the provision of external financing to firms, whereas Germany and the Netherlands have been viewed as bank-oriented financial systems. This classification is confirmed in *Table IA*, which presents a number of ratios that are indicative of the relative 'depth' of bank financing versus financial market financing (stocks and bonds) in the respective countries in the year 1997. The table incorporates stock market data from Morgan Stanley Capital International Perspective, Domestic Credit and GDP data from International Financial Statistics, and bond market data from Merrill Lynch Size and Structure of the World Bond Market (2000). *Table IB* reports similar data for the year 1986.[7]

From *Table IA* it follows that the stock market capitalizations of the US and the UK in 1997, expressed as a percentage of GDP, were more than double the size of those in Germany and the Netherlands (see column 3). The stock market capitalization of the Netherlands exceeded that of Germany.

A comparison of domestic bank credit to the non-government sector in 1997 shows that the relative amounts of bank financing in the Netherlands and Germany (expressed as a percentage of GDP) were similar, and equaled almost twice the size of the amount of bank financing in the US (see column 1). This is consistent with the view that bank-

7 Data for the year 1986, which were also reported in the Rajan and Zingales (1995) study, are included for comparison reasons.

oriented financial systems have relatively small financial (equity) markets, and vice versa. An interesting observation is that, based on these figures, the UK can less easily be classified as either a bank-dominated or a (stock) market-dominated financial system. More specifically, in 1997 the UK had the largest relative depth in both bank financing and stock market financing (expressed as a percentage of GDP). *Table IB* shows that this implies a significant growth in the relative importance of bank financing in the UK during the period 1986-1997. By comparison, in 1986 the domestic bank credit to the non-government sector (as a percentage of GDP) in the UK was the smallest of the four countries, while the relative size of the UK stock market was the largest.[8]

Table IA also presents various measures of the importance of the (corporate) bond market in the different countries. The table shows that the total bond market capitalization as a percentage of GDP in both Germany and the Netherlands is substantially larger than that of the UK, and substantially smaller than that in the US (see column 5). The market capitalizations of the corporate bond segments in both the Netherlands and the UK, measured in absolute (dollar) size, are small relative to Germany and the US.[9] Expressed as a percentage of GDP, the German corporate bond market is the largest, and is more than twice the size of the US corporate bond market (see column 7). This can almost fully be explained by the issuance of bonds by banks and other financial intermediaries in Germany.[10] The last two columns of *Table IA* show the relative importance of the corporate bond market in the different countries for the financing of non-financial firms. The dollar amounts of bonds issued by non-financial firms in the year 1997 for the US, the UK, Germany and the Netherlands, expressed as a percentage of GDP, were 19.40%, 0.11%, 2.39% and 3.07% respectively (see column 11). This again points at a strong similarity (in terms of external financing to non-financial firms) between the financial systems of Germany and the Netherlands.[11] The table also shows that only in the US the corporate bond market plays a significant role in the provision of debt financing to non-financial corporations. The importance of the corporate bond market in the UK, on the other hand, is almost negligible. A final remark that can be made is that, while *Table IA* reports figures for the year 1997 (so as to be comparable to the Global Vantage data discussed in Section 3), the non-financial segment of the Dutch corporate bond market has shown rapid growth during the period 1997-1999 (with the total amount of corporate bonds outstanding growing by 25% alone in 1999, see Merrill Lynch, Size and Structure of the World Bond Market, April 2000). A potential explanation is that the creation, and more specifically the introduction, of the Euro has spurred an expansion in

8 One reason for this growth is that 1986 marks the 'big bang' in the UK financial markets that allowed free entry and acquisitions by non-UK banks. Moreover, the tendency of the big UK clearing banks to collude on prices and interest rates came to an end. After 1986, there was a considerable increase in competition in the UK banking system.

9 For the Netherlands, this is primarily due to the dominance of government bonds in the Dutch bond market (see Boot, Ligterink and Schmeits, 1997).

10 A similar observation can be made for the Netherlands, where the number of corporate bonds issued by 'financials' is large, see column 8 of Table IA.

11 It should also be noted that the Eurobond market is an important funding source for the large Dutch corporations (see also Chapter 2). In 1997, Dfl. Eurobonds outstanding amounted to Dfl. 178 billion (approximately $89 billion), an amount which exceeded the size of the Dutch domestic corporate bond market (in market capitalization). More than half of the total amount of bonds issued by the Dutch non-financial corporate sector therefore is issued in the Eurobond market.

investor demand, reflecting a broader and more liquid market (especially for lower quality corporate issuers), and a nascent Euro corporate junk bond market. The major reason for this is that the issuance of corporate bonds in a single currency has considerably enhanced the breadth and liquidity of the secondary market. This has been stimulated by the emergence of specialized 'vulture funds' in European debt.

Summarizing, based on a comparison of the relative importance of bank financing and financial market financing to non-financial corporations as a percentage of GDP, the Dutch and the German financial systems are very similar: both systems are characterized by an important role of bank financing and a relatively small role of equity and bond markets. Bank financing is less important in the US, relative to the importance of equity and bond markets.[12] In the UK, both equity financing and bank financing are important, however the role of the bond market in the financing of non-financial firms is insignificant.

1.3 An International Comparison of the Capital Structures of Non-Financial Firms

In this section, we report the results of a capital structure comparison for publicly listed non-financial firms in the Netherlands, Germany, the US and the UK, based on the Global Vantage database. As described above, this database includes publicly traded firms that are part of the local stock market index or an international stock market index, which report consolidated balance sheets.[13] For the year 1997, our samples for the Dutch, German, US and UK firms include 139, 399, 2308 and 1132 firms, respectively. While the results for 1997 may in part reflect the interest rates in that year and their effect on firms' leverage decisions, we also examine the time-series behavior of many of these ratios. These ratios (as ratios of 'stock' variables) show quite a strong degree of stability over time, so that 1997 appears to be a reasonably representative year. Our findings are reported in the *Tables II* through *IV* and the *Figures I* through *IV*.

1.3.1 A Comparison of Summary Balance Sheets

Table II compares the average (or: summary) balance sheets of all firms in each country sample for the year 1997. From a comparison of the asset side of the balance sheets, it follows that the fixed asset (tangible asset) ratios as a percentage of the book value of total assets are very similar across the four countries, with the ratios ranging between 30.7% and 37.6%. It has often been argued that the availability of tangible assets

12 Observe that, although Germany and the Netherlands are both bank-dominated financial systems, substantial differences exist with respect to the institutional design and the degree of concentration of the banking sector, as well as the ownership structure of banks (public versus private ownership) in both countries. For example, the German banking market is more geographically diverse and less concentrated than the Dutch banking market, and a large number of smaller (often government-controlled) banks capture around 50% of the German deposit base. In contrast, the big 4 Dutch banks control the majority of the Dutch deposit and lending market. Furthermore, non-bank sources of private debt financing for firms (institutional investors, etc.) are more prevalent in the Netherlands than in Germany. In addition, German banks differ from Dutch banks in the types of claims they hold in firms to which they provide financing. We will address some of these issues in Chapter 4.

13 Observe that this database may bias our sample of listed firms towards the larger listed corporations in each country. In Section 1.3.2 we will break down the leverage ratios in different asset-size quartiles in order to analyze how leverage varies with firm size. We will more explicitly distinguish between smaller and larger listed firms in Chapter 2, based on a different database. In that chapter our sample of listed firms includes smaller firms that are not part of the local stock market index (i.e., the AEX index).

increases firms' access to bank financing, since many bank loans require collateral backing. From the table it is also evident that the level and the composition of the current assets of firms in the sample differ across countries. In particular, there are substantial differences in accounts receivable between countries, with accounts receivable in the Netherlands almost twice as high as that in the US. This suggests that larger listed non-financial Dutch firms stand more ready to make trade credit available than firms in either the US, the UK or Germany. Thus, larger Dutch firms may be an important source of financing to smaller (vendor) firms.

On the liability side, the starkest contrast again exists between the Netherlands and the US. The current liabilities of Dutch firms in 1997, as a proportion of the book value of total assets, are almost twice as large as those in the US, and total 41.9%. A comparison of the debt in current liabilities ratios, moreover, shows that Dutch firms appear to use more than twice as much short-term debt (excluding accounts payable or other working capital items) relative to US firms. US non-financial firms, on the other hand, use almost twice as much long-term debt as their Dutch counterparts. These findings indicate a difference in the maturity structure of debt between Dutch and US firms. By contrast, the debt in current liabilities ratio (i.e., non-working capital related short-term debt), as well as the long-term debt ratio for listed German non-financial firms in 1997, are very similar to those of firms in the Netherlands, although the working-capital related current liabilities of German firms are substantially lower. These results suggest some similarities between the capital structure choices (i.e., leverage) and the debt maturity structure of Dutch and German firms. To the extent that bank financing tends to be short-term financing, these observations are again reflective of the bank-oriented financial systems in Germany and the Netherlands. As a final remark, note also the similarities with respect to both the debt maturity structure and the composition of the current liabilities between non-financial firms in the Netherlands and in the UK in 1997.

1.3.2 A Comparison of Leverage Ratios

The *Tables IIIA* through *IIID* document more detailed capital structure information for non-financial listed firms in the Netherlands, Germany, the US and the UK. More specifically, each of the tables reports nine alternative measures of leverage in book value terms (see Rajan and Zingales, 1995). The first four leverage ratios in Panel A of each table present measures of leverage using 'stock' (or balance sheet) figures. The first ratio, non-equity liabilities to total assets, represents the broadest definition of leverage, and can be viewed as a proxy of what is left for shareholders in case of liquidation of the firm's assets. Since this ratio includes both financing and working capital items (that are used for transaction purposes), this measure may overstate the firm's actual leverage. The second ratio, the debt ratio, does not include working capital items, and is generally viewed as the standard measure of leverage. The third ratio, debt to net assets, nets out assets that are offset by specific non-debt liabilities (for example, accounts receivable that are offset by accounts payable) from total assets. This ratio extracts the effects of trade credits, and can be useful to compare leverage in different industries. The fourth mea-

sure, debt to capital, excludes assets that are held against pension liabilities or provisions that are less related to the financing of the firm. The fifth ratio reported in each of the tables, the interest coverage ratio, is a 'flow' figure which reflects the ability of the firm to meet its fixed interest payments from its operating earnings. The last four ratios, presented in Panel B of each table, are adjusted leverage ratios. These ratios, which are defined in the tables, represent some limited adjustment in leverage measures that reflect the ability of firms to use cash and other short-term investments as liquid assets to offset certain liabilities. In the discussion that follows, we will concentrate on the first four (stock) measures of leverage, and in particular on ratio two, debt to total assets (debt ratio).

Besides aggregate leverage ratios, we present a breakdown of these ratios in asset-size quartiles (based on the book value of total assets), as well as a breakdown in short-term and long-term debt. It has often been argued that firm size and leverage are positively correlated (see, for example, Harris and Raviv, 1991). Larger firms tend to be more diversified, and therefore fail less often. As a result, these firms have easier access to external debt financing. However, in bank-dominated financial systems larger firms may be concerned about excessive leverage, and – due to potential hold-up problems – may not wish to become over-reliant on bank financing (see Rajan, 1992).[14] Which of these effects prevails is an empirical question, and depends on the development of the corporate bond market and also on the number of banks with which firms have relationships (see Petersen and Rajan, 1995, Ongena and Smith, 1999, and Saunders and Schmeits, 2001d).

The Netherlands

Table IIIA documents the leverage measures for firms in the Netherlands. The mean non-equity liabilities to total assets, debt to total assets, debt to net assets and debt to capital ratios in 1997 are 0.62, 0.22, 0.34 and 0.35 respectively. The breakdowns in asset-size quartiles appear to confirm the positive correlation between firm size and leverage: the largest two asset-size quartiles show higher leverage ratios than the smallest quartiles. This is consistent with the fact that larger firms have better access to the Dutch bond market than small firms, and therefore are more likely to issue domestic corporate bonds and Eurobonds. The limited size of the corporate bond market in the Netherlands, however, suggests that larger firms also rely on bank debt and/or other sources of private debt (although this is expected to be proportionally less than small firms).

The graphs 1 through 8 in *Figure I* document the time series behavior of the Dutch leverage ratios during the period 1989-1998. The period 1989-1998 includes at least one recession, and incorporates business cycle effects, as well as secular effects such as the global trend towards consolidation through mergers and acquisitions, that in many cases were debt financed. Indeed, from graph 1, which shows the mean leverage ratios for the four stock measures of leverage, it can be seen that all four ratios have slightly increased over the last decade. Recall that these leverage measures are expressed in book values,

14 For example, a firm that becomes too reliant on bank financing may find itself 'hostage' when it tries to finance a new project. Specifically, a main or relationship bank may seek to extract rents, or else 'hold-up' the supply of finance. Thus, large firms may seek to reduce leverage in order to reduce the power/control main banks have over them.

and hence do not reflect the rapid appreciation in market values of equity that have taken place during this period.[15]

Finally, *Table IVA* incorporates the debt maturity structure of Dutch non-financial listed firms, and presents two measures of short-term leverage (short-term debt to total assets and current liabilities to total assets) and two measures of long-term leverage (long-term debt to total assets and long-term liabilities to total assets). *Table IVA* confirms our findings from *Table II*. Dutch firms tend to rely heavily on short-term debt financing. For example, the mean current liabilities to total asset ratio in 1997 equaled 0.42. In contrast, the mean long-term debt to total asset ratio was 0.12. As can be seen from the breakdowns in asset-size quartiles, the use of short-term debt (excluding working capital related items) by Dutch listed firms appears to be inversely related with firm size, whereas the use of long-term debt seems to be positively related to firm size. Since DNB (2000) data show that bank loans are predominantly long-term loans (64% of bank loans has a maturity of more than 1 year versus 36% with a maturity of 1 year or less), these results are consistent with a bias in bank-supplied finance to larger companies. To the extent that loans are supply-side determined, these observations are consistent with banks being relatively risk-averse and more willing to lend long-term to large, inherently more diversified, firms than to smaller firms. To the extent that loans are demand-side determined – which is not an unreasonable assumption for the largest Dutch firms with access to international banking and alternative capital market sources of funds – the long-term maturity of their debt holdings may reflect their attempts to avoid 'hold-up' problems in investing in new projects. Overall, the supply-side story might offer the best explanation for small firms' greater reliance on short-term funds, while the demand-side story may offer a better explanation of the greater propensity of larger firms to have long-term debt on their balance sheets.

Germany

Table IIIB presents the aggregate leverage measures for listed non-financial firms in Germany. Based on our findings in *Table II* and our discussion of financial systems in Section 2, we might, ex ante, expect a greater degree of similarity between the capital structures of Dutch and German firms, relative to the firms in the Anglo-Saxon financial systems. Indeed, *Table IIIB* suggests that this similarity is quite strong: the mean non-equity liabilities to total assets ratio in 1997 is 0.68 (versus 0.62 in the Netherlands), the mean debt to total assets ratio is 0.19 (versus 0.22), and the mean debt to capital ratio equals 0.34 (versus 0.35). The one substantial difference is the debt to net assets ratio, which for Germany equals 0.18 and is substantially lower than for the Netherlands (0.32). This difference is largely due to the special treatment of pension liabilities in Germany (see also Rajan and Zingales, 1995). The table also suggests that the (positive) relationship between firm size and leverage appears to be weaker than in the

15 Observe that it is possible that market value based leverage ratios could reverse the trend. For the US, Saunders (2000) shows that market value based and book value based leverage ratios for the US went in different directions in the 1990s. Using a sample of Compustat firms, the book value based debt-equity ratio increased from 0.8 in 1990 to 1.2 in 1997. By contrast, the market value based debt-equity ratio fell from 0.9 to 0.5 over the same period (see Saunders, 2000).

Netherlands. In particular, for three out of the four leverage measures, the leverage ratios of firms in higher asset-size quartiles are not larger than those of firms in lower asset-size quartiles. This is consistent with the earlier findings of Rajan and Zingales (1995) for the year 1991, and suggests that there are offsetting effects in Germany that constrain the ability and willingness of larger, better diversified firms to exploit the advantages of leverage. Such concerns may include fear of excessive power of banks, and the related monopoly and 'hold-up' problems that this may entail.[16] To the extent that finance is demand-side determined for the largest German firms, this is consistent with these firms seeking to avoid the enhanced control that banks gain by being the dominant supplier of debt financing. Observe that, given the limited importance of the corporate bond market in Germany as a financing source for non-financial firms, debt financing is predominantly provided by banks. Thus, larger German firms beyond some point may prefer (internal) equity as a source of financing.

The graphs in *Figure II* plot the different leverage measures for German firms during the period 1989-1998. Whereas for the Netherlands there appeared to have been a modest upward trend in leverage during the last decade, for Germany the pattern of leverage over time has been relatively flat.

Table IVB captures the debt maturity structure of German non-financial listed firms. A comparison with the Netherlands indicates that the mean current liabilities to total assets ratio for German firms is smaller than that for Dutch firms (0.29 versus 0.42), whereas the mean long-term liabilities to total assets ratio is larger (0.38 versus 0.20). As discussed in Section 1.3.1, however, the mean short-term financing to total assets and long-term debt to total assets ratios for German firms are similar to those of Dutch firms. These observations suggest that German firms overall have less working capital related current liabilities relative to Dutch firms (and thus appear to use less trade credit), and also use more long-term financing.[17] *Table IVB* also implies that the long-term debt to asset ratio in Germany seems to be less sensitive to firm size. That is, firms in smaller asset-size quartiles use similar amounts of debt as larger firms.

Summarizing, although both Germany and the Netherlands have bank-dominated financial systems, and non-financial firms in these countries appear to have similar aggregate leverage structures, at least two important differences can be noted. First, the largest firms in Germany seem to have lower debt ratios relative to the Netherlands. Second, the financing of firms in Germany seems to be more long-term than in the Netherlands, and smaller firms use relatively more long-term debt than in the Netherlands.

16 An interesting question in this respect would be whether there are any differences in the competitive structure of the banking sector between Germany and the Netherlands, and/or whether there is any evidence for the existence of pricing differences or other differences in the contractual terms of bank financing that affect the larger respectively smaller firms in these two countries. These issues will be addressed in Chapter 3 and Chapter 4.

17 Note, however, that the main difference between the long-term liabilities to total asset ratios between Germany and the Netherlands are caused by the difference in 'other liabilities', rather than by a difference in the use of long-term debt. This difference therefore mainly reflects accounting differences in the reporting of pension liabilities (see also Rajan and Zingales, 1995).

The United States

In contrast to Germany and the Netherlands, the US has always been viewed as a market-oriented financial system, with large and well-established corporate bond and stock markets. It is therefore interesting to see how the capital structure choices of the US corporate sector compare to those in the Netherlands.

The leverage ratios for listed non-financial US firms are presented in *Table IIIC*. Overall, and perhaps surprisingly, the four basic leverage ratios do not show large differences between the US and the Netherlands. In particular, the mean non-equity liabilities to total assets ratio in the US in 1997 equals 0.54 (versus 0.62 in the Netherlands), the mean debt to assets ratio equals 0.27 (versus 0.22), the mean debt to net assets ratio is 0.34 (versus 0.33) and the mean debt to capital ratio is 0.35 (versus 0.37). *Table IIIC* also suggests that the largest US firms have the highest leverage ratios, but the difference between the largest and the smallest asset-size quartiles are relatively small. Interestingly, the smallest US firms have higher leverage ratios than intermediate range firms. This suggests a 'U-shaped' relationship between leverage and firm size, with the largest and smallest firms being relatively more leveraged than intermediate size firms. In contrast to the Netherlands, therefore, US firms show less substantial differences in leverage between small and large firms. Moreover, the leverage ratios of the smallest asset-size quartile of Dutch firms are smaller than those of US firms. Both observations are consistent with a relatively easier access of smaller firms to external debt in the US.

The graphs 1 through 8 in *Figure III* plot the time variability of leverage ratios in the US over the 1989-1998 period. While the leverage ratios of US firms had risen substantially in the 1980s on the back of the junk bond wave and the surge in mergers and acquisitions, these effects seem to have mitigated in the 1990s, in that most leverage ratios were fairly constant throughout the period 1989-1998 (see graph 1).

As indicated in Section 1.3.1, the debt maturity structure of non-financial listed firms in the US contrasts strongly with that of Dutch firms. *Table IVC* shows that Dutch firms rely substantially more on short-term debt than US firms, and much less on long-term debt. The mean current liabilities to total assets ratio for US firms in 1997 was 0.23 (versus 0.41 for the Netherlands), the short-term financing to total assets ratio was 0.09 (versus 0.18), and the mean long-term debt to total assets ratio equaled 0.21 (versus 0.12). The table also shows that US firms in smaller asset-size quartiles use more short-term financing (and have higher current liabilities) than firms in larger asset-size quartiles. The long-term debt ratios of US firms, however, seem insensitive to asset size. That is, in the US both small and large firms have similar mean long-term debt ratios. This is a striking difference with the Netherlands, where the smallest firms use lower amounts of long-term debt.

The United Kingdom

Finally, we document the capital structure choices of listed non-financial firms in the UK. While the UK has often been lumped with the US as a 'market-oriented' system, our discussion in Section 1.2 suggests that the similarity between the two countries is somewhat

overplayed. While the equity market in the UK is highly developed and has the largest market capitalization (as a percentage of GDP) in Europe, its corporate bond market is miniscule. As in other countries in Europe, corporate debt in the UK is primarily provided by banks.

Table IIID shows that overall leverage ratios in the UK appear to be the lowest of all four countries analyzed. In 1997, the mean non-equity liabilities to total asset ratio for UK firms was 0.53 (versus 0.62 in the Netherlands), the mean debt to total assets ratio was 0.18 (versus 0.22), the mean debt to net assets ratio was 0.26 (versus 0.32) and the mean debt to capital ratio equaled 0.28 (versus 0.35). These findings are consistent with Rajan and Zingales (1995). The lower leverage ratios in the UK relative to the US, which also has a deep equity market, may be explained by the absence of a deep corporate bond market. These observations also suggest that in the UK the cost of outside equity may not be substantially higher than the cost of private debt (including bank debt).[18] The firm size leverage relationship exhibits a similar 'U shape' to that observed in the US. That is, both small and large firms have higher leverage ratios than intermediate size firms.

Figure IV shows no obvious time trend for the leverage ratios of UK firms. Like in the US, most UK leverage ratios appear to have been quite flat during the period 1989-1998 (see graph 1).

The breakdown of aggregate leverage measures in short-term debt and long-term debt, reported in *Table IVD*, indicates that both the debt maturity structure and the composition of debt (in terms of working capital and non-working capital related items) of non-financial listed firms in the UK resemble those of Dutch firms more than either the US or Germany. Short-term financing is more dominant than long-term financing in the capital structures of UK firms. In 1997, the mean ratio of current liabilities to total assets in the UK was 0.39 (versus 0.42 in the Netherlands), the mean ratio of short-term financing to total assets was 0.13 (versus 0.18), and the mean long-term debt to total assets ratio equaled 0.10 (versus 0.12). The similarity in debt maturity also holds for the breakdown in asset-size quartiles.

1.3.3 Summary of Capital Structure and Balance Sheet Comparisons

To the extent that general conclusions can be drawn regarding the leverage of listed non-financial firms in the Netherlands vis-à-vis the US, the UK and Germany, we find that:

(*i*) The aggregate leverage ratios of Dutch firms are comparable to those of firms in the US and Germany, and higher than those of firms in the UK.

(*ii*) Large firms in the Netherlands have more leverage than small firms. This contrasts to Germany, where large firms have significantly less leverage, and also to the US and the UK, where large and small firms appear to be more leveraged than intermediate size firms.

18 Myers' (1984) pecking order theory generally argues that outside equity is more 'expensive' than outside debt for reasons relating to information asymmetries and flotation costs. Our findings therefore suggest that the cost of bank financing in the UK is relatively high, or that the cost of issuing equity is relatively low. Recent findings by Ljundqvist (2000) have shown that the underwriting spreads of new equity issues in the UK are significantly lower than in the US.

(*iii*) Non-financial firms in the Netherlands rely significantly more on short-term financing than firms in the US and Germany. Only UK firms seem to rely to a similar extent on short-term financing.

(*iv*) Small firms in the Netherlands and in the UK use significantly less long-term financing than small firms in Germany and in the US.

The combination of findings of (*i*) high leverage on average, (*ii*) relatively low leverage for small firms, and (*iii*) a predominance of short-term financing (*iv*) especially for small firms, might be expected in a bank-dominated financial system, in which both the equity market and the corporate bond markets are small (relative to GDP). In such a financial system, all but the largest firms (i.e., those with access to the domestic stock and corporate bond market and/or the Euro-markets) have little alternative but to rely on banks or other private debt for external finance, and in doing so, relationships become important. In general, smaller (and newer) firms have less strong relationships with bank lenders, and thus are more likely to be financing-constrained (see, for example, Boot and Thakor, 2001). Moreover, in a position of market power, banks are more likely to readily supply short-term financing than long-term debt. Short-term debt allows banks to more frequently monitor client firms, and to exercise potential monopoly power by 'holding up' renewals of loans in certain situations. Of course, an excessive use of monopoly power by banks may force firms to seek financing elsewhere. Our analysis provides some evidence of this for Germany (a largely concentrated bank-dominated financial system), where the largest firms have sought to reduce their leverage and thus their reliance on bank financing (see *Table IIIB*, and also Rajan and Zingales, 1995).

To the extent that policy implications can be drawn from the above regarding long-term financial system design, it can be noted that a more competitive banking system aligned with more developed, liquid and larger equity and corporate bond markets might not only change the leverage structures of firms, but may also allow smaller firms greater access to debt financing of a longer duration. Our findings suggest that this may be particularly important for the Netherlands and the UK.

1.4 An Overview of Other Institutional Factors that May Impact Leverage

So far, we have emphasized financial system architecture, and in particular the dominance of bank versus securities market financing, in our discussion of the differences in leverage ratios between firms in the Netherlands, Germany, the US and the UK. As argued in Rajan and Zingales (1995), however, the (historical) role of banks and financial markets in the provision of financing in an economy does not necessarily – nor exclusively – manifest itself in the degree of overall leverage chosen by firms in the different countries. In fact, our evidence suggests that the difference between bank-oriented and market-oriented financial systems is reflected more in the choice between public (stocks and bonds) and private financing (bank loans) than in the amount of leverage. For a given degree of overall leverage, these differences could also potentially show up in the debt maturity structure of firms in the different countries and/or in the breakdown of

leverage into asset-size quartiles (see also Section 1.3). In addition, as extensively discussed in the finance literature, within the context of an existing financial system design, other institutional factors, such as taxation, bankruptcy laws and corporate governance mechanisms, may have a direct impact on firms' capital structure choices. In this section, we briefly examine the differences in these factors across countries.

1.4.1 Leverage and Taxation

The effects of taxation on leverage are complex and hard to disentangle. An analysis of taxation effects does not only require knowledge of statutory personal and corporate tax rates, but more importantly, also of the effective tax rate of the corporation (after allowance for tax offsets, transfer pricing, etc.) as well as the marginal tax rate for investors (see Graham, 2000).[19] If we ignore personal tax rates and assume that effective and statutory corporate tax rates are the same (see Modigliani and Miller, 1958, and Miller, 1977), then we can make some fairly elementary corporate tax rate comparisons between countries using data provided by PriceWaterhouse for the year 1997, which may help indicate in which country debt is most advantaged through the tax-deductibility of interest payments.[20]

According to PriceWaterhouse, in 1997 the corporate income tax rate was 36% on the first Dfl. 100,000 ($50,000) of taxable income, and 35% thereafter under the Dutch Company Act. There are no provincial or municipal corporate income taxes. In Germany, corporate profits are subject to two types of taxes: a federal corporation tax and a municipal corporate tax. The German corporate tax rate is 30% (plus a 7.5% levy on the corporate tax paid), whereas the municipal rates range from 12% to 20.5%. In the US, firms pay corporate and state and municipal taxes. The current maximum federal corporate tax rate is 35%. The state and municipal taxes imposed generally range from 1% to 12%. The corporate tax rate in the UK, finally, equals 33%.

Overall, for large corporations paying the maximum tax rate, the national or federal tax rates are quite similar across the four countries. However, the taxation differs on the state and/or municipal level. In this respect, our observation on the low leverage ratios of large firms in Germany seems somewhat puzzling, given the relatively high level of municipal tax rate vis-à-vis other countries.

1.4.2 Leverage and Bankruptcy Laws

One possible reason for the reluctance of large German firms to increase their leverage – given the tax advantages of debt in that country – is the presence of rather strict and creditor friendly bankruptcy laws in Germany. According to Rajan and Zingales (1995), the German bankruptcy law gives creditors, and in particular banks, significant power over debtors. For example, distressed firms have to file a reorganization plan soon after distress occurs, and during the proceedings creditors can take actions such as replace-

19 In the finance literature, evidence on the impact of tax differences on leverage is mixed. Mayer (1988) argues that tax differences are not significant. King and Fullerton (1984) and Rajan and Zingales (1995), on the other hand, suggest that the impact of taxes on firms' leverage choices is subtle and cannot easily be dismissed. Both studies include the effects of personal taxes in their analysis. For an interesting international comparison of the tax differences between different European countries, see also Coopers and Lybrand (1993).

20 This year is the same as that for which the leverage ratios for firms in the different countries are reported.

ment of the firm's management. As a result, little reorganization occurs under the supervision of banks, and liquidations are frequent.

The US bankruptcy code (Chapter 11) is much more debtor friendly. Contrary to Germany, it includes a relatively long filing period for reorganization (up to 4 months), and a stay on creditor demands during that time (concerning the collection of debts and the protection of management rights, and involving frequent violations of the absolute priority rule (APR)). The US code appears to have strong incentives for reorganizations, and results in less liquidations.

The UK bankruptcy code appears to be similar to the German bankruptcy code, and has a stronger emphasis on creditor rights and liquidations than the US (see Franks and Torous, 1993). This may in part explain our finding of relatively low levels of leverage in the UK compared to the other three countries. That is, risk averse managers are more cautious in taking on leverage, because of the implications of bankruptcy and liquidation for their jobs.

The Dutch Bankruptcy Act (more than 100 years old) is designed to protect the interest of creditors in case a debtor-firm cannot fulfill its financial obligations. Either the firm, its creditors, or a public prosecutor can file for bankruptcy. The Dutch bankruptcy code lays out procedures for the liquidation as well as the (financial) reorganization of distressed firms. It also allows courts to grant suspension of payment on ordinary debts, with the aim of giving the firm in distress the opportunity to reorganize. Some people believe that the Dutch bankruptcy code does not give firms enough opportunity to restructure their businesses: too many firms that file for suspension are ultimately declared bankrupt (i.e., the recovery rates from bankruptcy filings are low). In 1996, the Dutch Supreme Court stated that a trustee should consider interests other than only those of the creditors in deciding on a firm's future. This may indicate that the Dutch Code is not totally creditor friendly. Overall, the Dutch bankruptcy law seems to lie between the relatively debtor friendly US bankruptcy code, and the more creditor friendly German and UK laws. Thus, in a relative sense, the Dutch bankruptcy law does not appear to be a major impediment to debt financing.[21]

1.4.3 Corporate Governance and Leverage

Considerable debate has occurred in the literature regarding the effects of corporate governance structures on firms' leverage and capital structure decisions. Particular emphasis has been placed on the existence of an 'active' takeover market, as well as the relevance of board composition in impacting leverage. For example, in an active (hostile) takeover market, managers of firms under a potential threat of a takeover may increase leverage, thereby installing 'poison pills' (see Harris and Raviv, 1988). Thus, based on this argument and holding other things constant, leverage might be higher in market-based financial systems, such as the US (and to some extent the UK), with active markets for corporate control and where hostile takeovers are not uncommon. By com-

21 For an extensive analysis of the Dutch bankruptcy code in an international context, see Boot and Ligterink (2000). Both that study and Rajan and Zingales (1995) present an excellent international comparison of bankruptcy legislations. We will revisit the differences in bankruptcy regulation between the four countries in Chapter 4.

parison, hostile takeovers in the Netherlands are virtually unknown, and are only recent (and still infrequent) phenomena in Germany.

Besides the market for corporate control (which can be viewed as an external governance mechanism), internal discipline and governance can also be provided by a firm's board of directors. Both the size and the composition of the board of directors could potentially have an impact on firms' leverage decisions. Evidence from several studies shows that banks play a much more active role on corporate boards in Germany than in either the US or the UK. Indeed, in the US, the restrictions on banks holding equity in a firm (except for limited periods post-bankruptcy) have severely limited such activities. By contrast, German banks play prominent roles on many boards. One possible explanation for the higher leverage of intermediate-sized firms in Germany is, that for these firms bank membership on boards is relatively most powerful, which may be reflected in greater bank borrowings (often from their own 'house' banks). The role of banks as members of boards of directors in the Netherlands is much more similar to that played by banks in Germany, than in the US (or the UK). Specifically, Dutch banks hold equity (block holdings) in a number of corporations, and also serve as non-executive (supervisory) directors on boards.

1.5 Cross-Sectional Tests Regarding the Determinants of Firm Leverage

As a final part of our international comparison of the capital structure choices of listed non-financial firms, it is interesting to look at the variability of leverage ratios across firms in the US, the UK, Germany and the Netherlands. Such an exercise allows us to gain additional insights into the determinants of leverage ratios of firms within each country. In this section, we therefore conduct cross-sectional regressions in order to analyze the correlations between the four 'stock' measures of leverage (i.e., non-equity to total assets, debt to total assets, debt to net assets, and debt to capital) and three, relatively measurable determinants of leverage for each country. The first determinant is the ratio of fixed assets to total assets (see also Section 1.3.1). This 'tangibility ratio' should reflect those assets that firms can post as collateral for secured credit. It is expected that there exists a positive relationship between tangibility of firm assets and firm leverage. The second determinant analyzed is the log of the book value of a firm's assets. As discussed earlier, a priori we might expect larger firms to have more leverage, since they tend to be better diversified and fail less frequently. The third determinant in our analysis is firm profitability (which serves as a proxy for retained earnings). Following Myers (1984), we might expect financial slack, such as retained earnings (or internal 'equity') to act as a substitute for more expensive external debt (either bank financing or public debt). Thus, the more profitable the company, the lower its leverage. That is, firm profitability and leverage should be inversely related.

The results of our cross-sectional regressions of leverage on our proxies for tangibility of firm assets, firm size and firm profitability for the year 1997 are shown in *Table V*. Each table shows four panels (A through D), each corresponding to one of the four basic

leverage ratios as the dependent variable. Our regressions are estimated using maximum likelihood and a censored Tobit model. For firm i in each country the estimated regression model is given by:

$$\text{Leverage}_i = \alpha + \beta_1 \text{ Tangibility} + \beta_2 \text{ Logassets} + \beta_3 \text{ Profitability} + \varepsilon_i$$

With respect to the most general leverage measure used, the debt to total assets ratio in panel B of *Table V*, we find that in all four countries leverage and asset tangibility are positively correlated. That is, the higher the ratio of fixed assets to total assets, the more leveraged a firm will be. This is consistent with collateral availability being an important determinant of the degree of debt financing. Interestingly, the sizes of the tangibility coefficients are also quite similar across countries. That is, regardless of a bankruptcy system's relative creditor or debtor bias in the respective countries (see Section 1.4.2), the availability of tangible collateral has a similar effect on easing debt financing constraints.

With respect to our proxy for firm size (i.e., the log of the book value of total assets), there appear to be some interesting differences between our regression findings and our observations based on the different asset-size quartiles for each country, as reported in the *Tables IIIA* through *IIID*. For Germany, there appears to be a negative relationship between debt to total assets ratios and firm size. This supports our observation that large German firms appear to be less leveraged than smaller firms (see *Table IIIB*). For the Netherlands, the relationship between leverage and firm size is positive, but statistically insignificant at the 10% level (although it is significantly positive at the 5% level in the debt to total capital regression in panel D of *Table V*). Note that the maximum likelihood estimate of the parameters of the Tobit model inherently allow for non-linearities among the independent variables (such as size, etc. and leverage).[22]

Table V furthermore shows that our proxy of firm profitability (defined as the ratio of EBIT to the book value of total assets) in all countries is significantly negatively related to the debt to total assets ratio. Moreover, this negative relationship appears to hold for all four leverage measures in the panels A through D of *Table V*). Thus, the higher the amount of financial slack (or internal equity), the lower is a firm's reliance on outside debt (see Myers and Majluf, 1984). Perhaps of some importance is the magnitude of this coefficient for the Netherlands. As can be seen from *Table V*, in terms of absolute size the coefficient for the Netherlands is twice as large as the coefficient for Germany, and over eight times the size of the coefficients for the US and the UK. A potential implication of this is that external (debt) financing relative to internal financing is very costly in the Netherlands, and that retained earnings (or free cash flow) are readily substituted for debt when available. Observe finally that three of the four leverage measures show a high negative impact of profitability on leverage for the Netherlands.[23]

22 However, we did not explicitly try to fit a 'U-shaped' function to the data (implied by the quartile results). Rather, we allowed the data to determine the functional form of the explanatory equations.

23 It might be noted again that the Global Vantage database seeks to adjust (as much as possible) national accounting data to a homogeneous standard to aid comparability of accounting data and ratios across countries. Thus, while we cannot rule out some national accounting specific noise, the differences here are so large as to make an accounting definition explanation for these results unlikely.

1.6 Summary and Conclusions

In this chapter, we used the Global Vantage database to document the financing behavior of publicly traded non-financial corporations in the Netherlands, Germany, the US and the UK. The Global Vantage database allows an analysis of cross-country corporate leverage and financing differences using a relatively homogeneous set of accounting statements. Using data for 1989-98 (with particular emphasis on 1997), nine alternative leverage ratios were analyzed along with their size decomposition and maturity structure (short-term versus long-term debt breakdown). We also examined cross-sectional correlations between leverage and firm size, firm profitability and the tangibility of firm assets for each of the countries.

We compared the financing behavior of Dutch firms with firms in Germany, the US and the UK. Germany has traditionally been viewed as a bank-oriented financial system, whereas the US and the UK are considered to be market-oriented financial systems. Our objective was to document the similarities and differences between the Netherlands and these countries in terms of capital structures and debt composition, and to examine the extent to which financial system design had an impact on leverage along with other factors, such as tax effects, bankruptcy regulations and corporate governance structures.[24]

Overall, our analysis indicates that the capital structures of non-financial listed firms in the Netherlands have some common and some relatively unique features in comparison with other countries. First, leverage ratios of firms in the Netherlands are quite similar to those of firms in the US and Germany, but higher than those of firms in the UK. Second, larger firms appear to be relatively more leveraged in the Netherlands compared to Germany (where large firms have the lowest leverage). Third, similar to firms in the UK, Dutch firms have a much stronger reliance on short-term financing than either German or US firms. Fourth, again similar to the UK, the smallest firms in the Netherlands use low amounts of long-term debt financing relative to the smallest firms in either Germany or the US.

Relatively high leverage ratios, with greater amounts of debt financing for larger firms and large amounts of short-term debt financing (in particular for smaller firms), are features of a bank-dominated financial system, in which banks have some market power and corporate bond markets for non-financial firms are small. Indeed, the small size of the Dutch corporate bond market (and the inactivity of the Dutch market for corporate control) tends to reinforce the power of banks over Dutch firms. The effect of this is reflected in the high impact on leverage of the profitability of Dutch companies. That is, Dutch firms readily substitute internally generated cash flows (or retained earnings)

24 Specific and comparative data on bank financing 'per se' do not exist for firms in either the Netherlands or other countries. A breakdown of debt into different funding sources therefore cannot be made directly from capital structure data. Some recent studies attempt to approximate the extent of Npublic versus private (debt) financing indirectly. For example, Houston and James (1996) use US accounting data to compare private (bank) debt with public debt. However, in this study private debt is calculated as an accounting statement residual and, as a consequence, the amount of private debt financing is overstated. An example for the Netherlands is the study by De Haan and Hinloopen (1999), which also uses (incremental) accounting data to estimate the amount of private debt financing. One public policy recommendation is that some degree of harmonization of financial statements across countries, regarding the scale (and if possible) maturity of bank financing and other sources of private debt is clearly desirable

for leverage, when available. Moreover, the Dutch bankruptcy law has traditionally been creditor friendly, albeit not to the extent of bankruptcy regulations in Germany or the UK. Nevertheless, the effect of tangible assets (fixed assets), which may serve as collateral, on firms' leverage decisions appear to be quite similar across both creditor friendly and debtor friendly countries. Finally, to the extent that high tax rates tend to induce more leverage, the federal-level corporate tax rates in the four countries analyzed were quite similar. In Chapter 3 and Chapter 4 of this study, we will analyze the degree to which the apparent dominance of banks in the Dutch financial system is reflected in bank interest rates and spreads, and other contractual features of bank loans.

Table IA: The Size of the Capital Market in Germany, the Netherlands, the UK, and the US – 1997

Country	(1) Domestic Bank Credit to the Non-Govern-ment Sector as a Fraction of GDP (%)*	(2) Stock Market Cap. at 31 December ($ billion)	(3) Stock Market Cap. as a Fraction of GDP (%)	(4) Total Bond Market Cap. ($ billion)	(5) Total Bond Market Cap. as a Fraction of GDP (%)	(6) Total Corporate Bonds Outstanding ($ billion)	(7) Total Corporate Bonds Outstanding as a Fraction of GDP (%)	(8) Total Financial Corporate Bonds Outstanding ($ billion)	(9) Total Financial Corporate Bonds Outstanding as a Fraction of GDP (%)	(10) Total Non-Financial Corporate Bonds Outstanding ($ billion)	(11) Total Non-Financial Corporate Bonds Outstanding as a Fraction of GDP (%)
Germany	112.85	825.2	40.33	2207.41	107.89	1113.16	97.50	1110.43	97.26	2.73	2.39
The Netherlands	112.14	358.3	50.94	351.77	100.88	91.02	26.10	80.31	23.03	10.71	3.07
United Kingdom	121.16	2097.6	157.78	792.83	59.64	28.78	2.16	27.29	2.05	1.49	0.11
United States	65.56	8607.4	103.64	11563.5	138.24	3168.4	38.15	1557.5	18.75	1610.9	19.40

Source: Stock Market data are from Morgan Stanley Capital International Perspective, Domestic Credit and GDP data from International Financial Statistics, and Bond Market Data are from the Datastream database. Bond Market data are from Merrill Lynch, Size and Structure of the World Bond Market, April 2000.

*Note: Domestic Bank Credit to the Non-Governmental Sector data for Germany and Netherlands include claims on official entities and private sectors, while the data for United Kingdom and the United States include only claims on private sectors.

Table IB: The Size of the Capital Market in Germany, the Netherlands,the UK, and the US – 1986

Country	Domestic Bank Credit to the Non-Governmental Sector as a Fraction of GDP (%)	Stock Market Capitalization ($ billion)	Stock Market Capitalization as a Fraction of GDP (%)	Bond Market Capitalization ($ billion)	Bond Market Capitalization as a Fraction of GDP (%)
Germany	93.82	245.9	24.75	1.34	0.13
The Netherlands	66.78	73.3	36.71	NA	NA
United Kingdom	54.2	439.5	78.32	14.01	2.48
United States	71.07	2203.2	49.31	993.20	23.27

Source: Stock Market data are from Morgan Stanley Capital International Perspective, Domestic Credit and GDP data from International Financial Statistics, and Bond Market Data are from Rajan and Zingales (1995), Table VIII.

Table II: Balance Sheet for Non-Financial Firms in the U.S., Germany, Netherlands, and the UK – 1997

	United States	Germany	United Kingdom	Netherlands
ASSETS				
Cash and short-term investments	10.8	10.2	13.6	8.8
Account receivable/debtors	16.8	22.2	23.5	32.2
Inventories	15.1	18.9	16.1	17.4
Current assets-other	3.5	5.4	3.9	1.8
Current assets – total	44.3	56.8	57.1	60.1
Fixed assets (tangible)	34.5	30.7	37.6	32.5
Investments and advances – equity	1.3	1.0	1.1	1.2
Investment and advances – other	2.7	6.8	2.0	3.3
Intangible assets	8.1	4.4	1.7	2.5
Assets – other	7.1	0.3	0.5	0.3
Assets – total	100.0	100.0	100.0	100.0
LIABILITIES				
Debt in current liabilities	4.3	9.0	6.6	9.2
Accounts payable/creditors	9.2	10.1	14.6	14.2
Current liabilities – other	10.7	10.1	18.0	18.5
Current liabilities – total	23.4	29.1	39.1	41.9
Deferred taxes	3.0	0.3	0.7	1.8
Long-term debt	21.4	9.7	10.3	11.6
Minority interest	0.6	1.3	0.6	0.7
Reserves – untaxed	0	1.5	0.005	0.02
Liabilities – other	5.2	25.6	2.7	5.7
Liabilities – total	54.2	67.6	53.4	61.7
Shareholders' equity	45.6	32.4	46.6	38.3
Total liabilities and shareholders' equity	100.0	100.0	100	100.0

The value of each item is calculated as a fraction of the book value of total assets and then averaged across all firms reporting consolidated balance sheets in each country. Only balance sheets of non-financial firms are included. Firms for which shareholder's equity is negative are excluded.

Source: Global Vantage Database.

Table IIIA: Extent of Leverage and Adjusted Leverage in Netherlands - 1997

Leverage measures are calculated for all non-financial companies reporting consolidated balance sheets in 1997. Both debt and equity are measured at book value. Firms for which shareholders' equity is negative are excluded. In Panel A, Non-equity liabilities to total assets is the sum of all liabilities divided by the book value of total assets. Debt to total assets is the book value of short-term debt plus long-term debt divided by total assets. Debt to net assets is the book value of short-term and long-term debt divided by the book value of net assets, where net assets is equal to total assets minus accounts payable and other current liabilities. Debt to capital is the book value of debt divided by the sum of the book values of debt and equity. Debt to equity is the book value of debt divided by the book value of shareholders' equity. The interest coverage ratio is earnings before interest and taxes (EBIT) divided by interest payments. In Panel B, adjusted assets are total assets less intangibles. Adjusted Leverage 1 is total liabilities less cash plus intangible assets, divided by adjusted assets. Adjusted Leverage 2 is total liabilities less cash and deferred taxes plus intangibles, divided by adjusted assets. Adjusted Leverage 3 is the book value of short-term and long-term debt plus intangibles less cash and short-term investments, divided by adjusted assets. In all our definitions short-term debt is the sum of debt in current liabilities, long-term debt due in one year and other short-term borrowings. Adjusted Leverage 4 is the book value of short-term and long-term debt plus intangibles less cash and short-term investments and deferred taxes, divided by adjusted assets.

Panel A: Extent of Leverage

	Number of Firms	Nonequity Liabilities to Total Assets		Debt to Total Assets		Debt to Net Assets		Debt to Capital		Interest Coverage Ratio	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firms	139	0.62	0.63	0.22	0.20	0.32	0.32	0.35	0.35	106.21	19.79
Top 25% by total assets	35	0.67	0.68	0.24	0.22	0.36	0.33	0.42	0.40	16.67	14.54
Second 25% by total assets	35	0.65	0.69	0.21	0.19	0.32	0.33	0.36	0.36	40.56	40.50
Third 25% by total assets	35	0.60	0.63	0.24	0.24	0.33	0.34	0.35	0.34	29.30	20.63
Bottom 25% by total assets	34	0.55	0.57	0.19	0.20	0.27	0.29	0.28	0.31	346.11	67.36

Panel B: Extent of Adjusted Leverage

	Number of Firms	Adjusted Leverage 1		Adjusted Leverage 2		Adjusted Leverage 3		Adjusted Leverage 4	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firms	139	0.64	0.58	0.62	0.56	0.19	0.16	0.17	0.14
Top 25% by total assets	35	0.85	0.71	0.83	0.69	0.34	0.19	0.32	0.17
Second 25% by total assets	35	0.60	0.65	0.58	0.63	0.11	0.15	0.10	0.13
Third 25% by total assets	35	0.57	0.57	0.55	0.56	0.18	0.22	0.16	0.20
Bottom 25% by total assets	34	0.53	0.50	0.51	0.50	0.13	0.14	0.11	0.12

Source: Global Vantage Database.

Table IVA: Short-Term and Long-Term Debt to Total Assets Ratios in Netherlands - 1997

	Number of Firms	Short-term Financing/ Total Assets		Current Liabilities/ Total Assets		Long-term Debt/ Total Assets		Long-term Liabilities/ Total Assets	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firms	139	0.18	0.12	0.42	0.41	0.12	0.10	0.20	0.19
Top 25% by total assets	35	0.15	0.09	0.39	0.37	0.16	0.12	0.28	0.27
Second 25% by total assets	35	0.16	0.08	0.45	0.45	0.12	0.12	0.20	0.20
Third 25% by total assets	35	0.22	0.14	0.42	0.43	0.11	0.11	0.18	0.16
Bottom 25% by total assets	34	0.21	0.13	0.41	0.41	0.08	0.04	0.13	0.12

Debt to total assets ratios are calculated for all non-financial companies reporting consolidated balance sheets in 1997. Firms for which shareholders' equity is negative are excluded. Short-term financing is the sum of debt in current liabilities, long-term debt due in one year, and short-term borrowings.

Source: Global Vantage Database.

Table IIIB: Extent of Leverage and Adjusted Leverage in Germany - 1997

Leverage measures are calculated for all non-financial companies reporting consolidated balance sheets in 1997. Both debt and equity are measured at book value. Firms for which shareholders' equity is negative are excluded. In Panel A, Non-equity liabilities to total assets is the sum of all liabilities divided by the book value of total assets. Debt to total assets is the book value of short-term debt plus long-term debt divided by total assets. Debt to net assets is the book value of short-term and long-term debt divided by the book value of net assets, where net assets is equal to total assets minus accounts payable and other current liabilities. Debt to capital is the book value of debt divided by the sum of the book values of debt and equity. Debt to equity is the book value of debt divided by the book value of shareholders' equity. The interest coverage ratio is earnings before interest and taxes (EBIT) divided by interest payments. In Panel B, adjusted assets are total assets less intangibles. Adjusted Leverage 1 is total liabilities less cash plus intangible assets, divided by adjusted assets. Adjusted Leverage 2 is total liabilities less cash and deferred taxes plus intangibles, divided by adjusted assets. Adjusted Leverage 3 is the book value of short-term and long-term debt plus intangibles less cash and short-term investments, divided by adjusted assets. In all our definitions short-term debt is the sum of debt in current liabilities, long-term debt due in one year and other short-term borrowings. Adjusted Leverage 4 is the book value of short-term and long-term debt plus intangibles less cash and short-term investments and deferred taxes, divided by adjusted assets.

Panel A: Extent of Leverage

	Number of Firms	Nonequity Liabilities to Total Assets		Debt to Total Assets		Debt to Net Assets		Debt to Capital		Interest Coverage Ratio	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firms	399	0.68	0.71	0.19	0.14	0.23	0.18	0.34	0.33	3.69	7.03
Top 25% by total assets	100	0.75	0.76	0.14	0.11	0.18	0.14	0.32	0.29	5.42	4.16
Second 25% by total assets	100	0.70	0.73	0.20	0.19	0.25	0.24	0.38	0.39	8.64	6.90
Third 25% by total assets	100	0.65	0.68	0.20	0.18	0.25	0.23	0.34	0.34	13.71	10.80
Bottom 25% by total assets	99	0.60	0.61	0.21	0.13	0.25	0.17	0.32	0.26	3.76	7.03

Panel B: Extent of Adjusted Leverage

	Number of Firms	Adjusted Leverage 1		Adjusted Leverage 2		Adjusted Leverage 3		Adjusted Leverage 4	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firms	399	0.70	0.70	0.70	0.70	0.16	0.11	0.16	0.11
Top 25% by total assets	100	0.84	0.78	0.83	0.78	0.14	0.08	0.14	0.08
Second 25% by total assets	100	0.78	0.72	0.78	0.71	0.22	0.16	0.22	0.16
Third 25% by total assets	100	0.64	0.67	0.64	0.67	0.15	0.11	0.15	0.11
Bottom 25% by total assets	99	0.55	0.58	0.55	0.58	0.13	0.10	0.12	0.10

Source: Global Vantage Database.

Table IVB: Short-Term and Long-Term Debt to Total Assets Ratios in Germany

	Number of Firms	Short-term Financing/ Total Assets		Current Liabilities/ Total Assets		Long-term Debt/ Total Assets		Long-term Liabilities/ Total Assets	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firms	399	0.18	0.09	0.29	0.26	0.10	0.06	0.38	0.38
Top 25% by total assets	100	0.12	0.07	0.26	0.23	0.08	0.05	0.49	0.49
Second 25% by total assets	100	0.19	0.11	0.30	0.27	0.11	0.08	0.40	0.40
Third 25% by total assets	100	0.19	0.12	0.29	0.28	0.10	0.07	0.36	0.34
Bottom 25% by total assets	99	0.22	0.09	0.31	0.27	0.09	0.05	0.29	0.25

Debt to total assets ratios are calculated for all non-financial companies reporting consolidated balance sheets in 1997. Firms for which shareholders' equity is negative are excluded. Short-term financing is the sum of debt in current liabilities, long-term debt due in one year, and short-term borrowings.

Source: Global Vantage Database

Table IIIC: Extent of Leverage and Adjusted Leverage in the United States - 1997

Leverage measures are calculated for all non-financial companies reporting consolidated balance sheets in 1997. Both debt and equity are measured at book value. Firms for which shareholders' equity is negative are excluded. In Panel A, Non-equity liabilities to total assets is the sum of all liabilities divided by the book value of total assets. Debt to total assets is the book value of short-term debt plus long-term debt divided by total assets. Debt to net assets is the book value of short-term and long-term debt divided by the book value of net assets, where net assets is equal to total assets minus accounts payable and other current liabilities. Debt to capital is the book value of debt divided by the sum of the book values of debt and equity. Debt to equity is the book value of debt divided by the book value of shareholders' equity. The interest coverage ratio is earnings before interest and taxes (EBIT) divided by interest payments. In Panel B, adjusted assets are total assets less intangibles. Adjusted Leverage 1 is total liabilities less cash plus intangible assets, divided by adjusted assets. Adjusted Leverage 2 is total liabilities less cash and deferred taxes plus intangibles, divided by adjusted assets. Adjusted Leverage 3 is the book value of short-term and long-term debt plus intangibles less cash and short-term investments, divided by adjusted assets. In all our definitions short-term debt is the sum of debt in current liabilities, long-term debt due in one year and other short-term borrowings. Adjusted Leverage 4 is the book value of short-term and long-term debt plus intangibles less cash and short-term investments and deferred taxes, divided by adjusted assets.

Panel A: Extent of Leverage

	Number of Firms	Nonequity Liabilities to Total Assets		Debt to Total Assets		Debt to Net Assets		Debt to Capital		Interest Coverage Ratio	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firms	2308	0.54	0.56	0.27	0.27	0.34	0.34	0.37	0.38	67.76	18.38
Top 25% by total assets	577	0.57	0.61	0.27	0.28	0.33	0.34	0.39	0.41	23.48	16.67
Second 25% by total assets	577	0.53	0.54	0.26	0.26	0.32	0.33	0.35	0.37	31.70	17.88
Third 25% by total assets	577	0.52	0.53	0.26	0.26	0.32	0.33	0.35	0.36	35.03	22.20
Bottom 25% by total assets	577	0.54	0.56	0.30	0.27	0.39	0.35	0.39	0.36	180.65	18.09

Panel B: Extent of Adjusted Leverage

	Number of Firms	Adjusted Leverage 1		Adjusted Leverage 2		Adjusted Leverage 3		Adjusted Leverage 4	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firms	2308	0.67	0.60	0.64	0.55	0.34	0.29	0.31	0.24
Top 25% by total assets	577	0.75	0.66	0.69	0.58	0.38	0.32	0.32	0.25
Second 25% by total assets	577	0.70	0.61	0.66	0.56	0.36	0.30	0.33	0.25
Third 25% by total assets	577	0.65	0.56	0.62	0.52	0.33	0.27	0.30	0.22
Bottom 25% by total assets	577	0.58	0.54	0.57	0.53	0.29	0.24	0.27	0.24

Source: Global Vantage Database.

Table IVC: Short-Term and Long-Term Debt to Total Assets Ratios in the United States - 1997

Debt to total assets ratios are calculated for all non-financial companies reporting consolidated balance sheets in 1997. Firms for which shareholders' equity is negative are excluded. Short-term financing is the sum of debt in current liabilities, long-term debt due in one year, and short-term borrowings.

	Number of Firms	Short-term Financing/ Total Assets		Current Liabilities/ Total Assets		Long-term Debt/ Total Assets		Long-term Liabilities/ Total Assets	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firms	2308	0.09	0.03	0.23	0.20	0.21	0.20	0.31	0.30
Top 25% by total assets	577	0.08	0.04	0.21	0.20	0.22	0.22	0.36	0.37
Second 25% by total assets	577	0.07	0.03	0.22	0.20	0.22	0.21	0.31	0.31
Third 25% by total assets	577	0.06	0.02	0.22	0.20	0.22	0.21	0.30	0.29
Bottom 25% by total assets	577	0.13	0.05	0.28	0.25	0.20	0.13	0.26	0.20

Source: Global Vantage Database.

Table IIID: Extent of Leverage and Adjusted Leverage in the United Kingdom - 1997

Leverage measures are calculated for all non-financial companies reporting consolidated balance sheets in 1997. Both debt and equity are measured at book value. Firms for which shareholders' equity is negative are excluded. In Panel A, Non-equity liabilities to total assets is the sum of all liabilities divided by the book value of total assets. Debt to total assets is the book value of short-term debt plus long-term debt divided by total assets. Debt to net assets is the book value of short-term and long-term debt divided by the book value of net assets, where net assets is equal to total assets minus accounts payable and other current liabilities. Debt to capital is the book value of debt divided by the sum of the book values of debt and equity. Debt to equity is the book value of debt divided by the book value of shareholders' equity. The interest coverage ratio is earnings before interest and taxes (EBIT) divided by interest payments. In Panel B, adjusted assets are total assets less intangibles. Adjusted Leverage 1 is total liabilities less cash plus intangible assets, divided by adjusted assets. Adjusted Leverage 2 is total liabilities less cash and deferred taxes plus intangibles, divided by adjusted assets. Adjusted Leverage 3 is the book value of short-term and long-term debt plus intangibles less cash and short-term investments, divided by adjusted assets. In all our definitions short-term debt is the sum of debt in current liabilities, long-term debt due in one year and other short-term borrowings. Adjusted Leverage 4 is the book value of short-term and long-term debt plus intangibles less cash and short-term investments and deferred taxes, divided by adjusted assets.

Panel A: Extent of Leverage

	Number of Firms	Nonequity Liabilities to Total Assets		Debt to Total Assets		Debt to Net Assets		Debt to Capital		Interest Coverage Ratio	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firms	1132	0.53	0.53	0.18	0.16	0.26	0.24	0.28	0.26	81.59	19.42
Top 25% by total assets	283	0.54	0.54	0.22	0.20	0.30	0.29	0.33	0.32	16.07	11.55
Second 25% by total assets	283	0.49	0.50	0.16	0.14	0.23	0.21	0.24	0.23	23.98	16.35
Third 25% by total assets	283	0.51	0.52	0.15	0.13	0.23	0.22	0.24	0.23	39.71	26.38
Bottom 25% by total assets	283	0.59	0.62	0.17	0.13	0.29	0.22	0.31	0.25	247.92	90.94

Panel B: Extent of Adjusted Leverage

	Number of Firms	Adjusted Leverage 1		Adjusted Leverage 2		Adjusted Leverage 3		Adjusted Leverage 4	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firms	1132	0.48	0.47	0.47	0.47	0.07	0.09	0.07	0.08
Top 25% by total assets	283	0.56	0.49	0.55	0.49	0.17	0.12	0.16	0.12
Second 25% by total assets	283	0.43	0.44	0.42	0.43	0.05	0.08	0.04	0.07
Third 25% by total assets	283	0.44	0.47	0.43	0.47	0.05	0.08	0.04	0.07
Bottom 25% by total assets	283	0.48	0.53	0.48	0.52	0.02	0.02	0.02	0.02

Source: Global Vantage Database.

Table IVD: Short-Term and Long-Term Debt to Total Assets Ratios in the United Kingdom - 1997

Debt to total assets ratios are calculated for all non-financial companies reporting consolidated balance sheets in 1997. Firms for which shareholders' equity is negative are excluded. Short-term financing is the sum of debt in current liabilities, long-term debt due in one year, and short-term borrowings.

	Number of Firms	Short-term Financing/ Total Assets		Current Liabilities/ Total Assets		Long-term Debt/ Total Assets		Long-term Liabilities/ Total Assets	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firms	1132	0.13	0.08	0.39	0.38	0.10	0.07	0.14	0.12
Top 25% by total assets	283	0.11	0.08	0.32	0.32	0.16	0.14	0.23	0.21
Second 25% by total assets	283	0.11	0.07	0.35	0.35	0.10	0.07	0.14	0.12
Third 25% by total assets	283	0.13	0.08	0.40	0.41	0.08	0.05	0.11	0.07
Bottom 25% by total assets	283	0.17	0.08	0.50	0.49	0.07	0.03	0.10	0.06

Source: Global Vantage Database.

Table V: Factors Correlated with Extent of Leverage in Germany, Netherlands, the UK, and the US - 1997

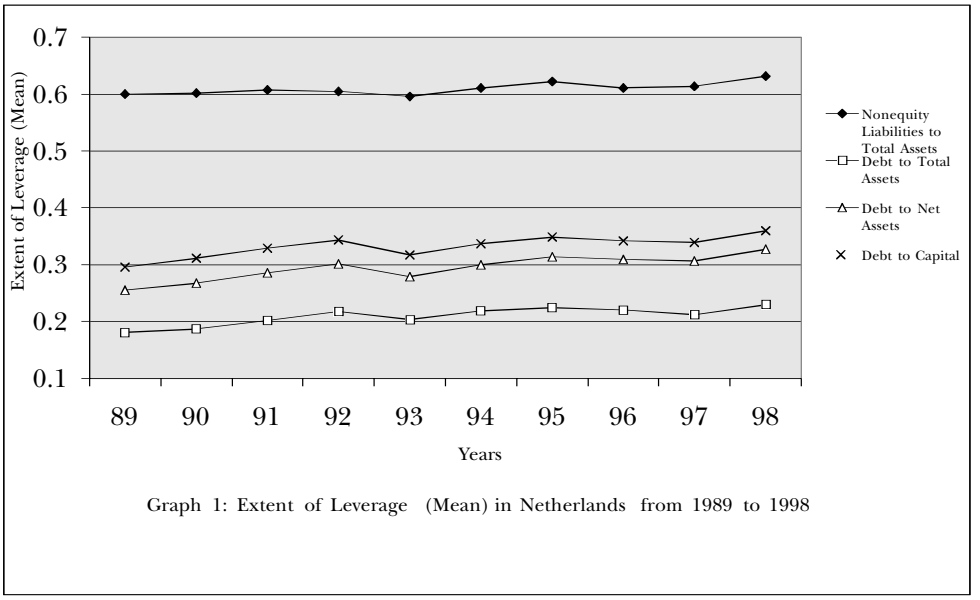
The dependent variable in Panel A is non-equity liabilities to total assets, which is the sum of all liabilities divided by the book value of assets. In Panel B, debt to total assets is the book value of short term plus long-term debt divided by total assets. In Panel C, debt to net assets is the book value of debt divided by net assets, where net assets equals total assets minus accounts payable and other current liabilities. And in Panel D, debt to capital is the book value of debt divided by the sum of the book value of debt and equity. Tangibility is the ratio of fixed assets to the book value of total assets. Logassets is the logarithm of total assets. Profitability is EBIT divided by the book value of assets. Standard errors are in parentheses. The regression is estimated using maximum likelihood and a censored Tobit model. The estimated model is: $\text{Leverage}_{[\text{Firm i}]} = \alpha + \beta_1 \text{ Tangibilityi} + \beta_2 \text{ Logassets}_i + \beta_3 \text{ Profitabilityi} + \varepsilon_i$.

Country Variable	Germany	Netherlands	United Kingdom	United States
	Panel A: Nonequity Liabilities to Total Assets			
Intercept	0.51*** (0.03)	0.57*** (0.06)	0.45*** (0.02)	0.23*** (0.02)
Tangibility	0.03 (0.04)	-0.12 (0.07)	-0.16*** (0.02)	0.11*** (0.03)
Logassets	0.07*** (0.009)	0.04*** (0.02)	0.07*** (0.007)	0.09*** (0.007)
Profitability	-0.78*** (0.07)	-0.36** (0.18)	-0.006 (0.03)	-0.02*** (0.006)
Number of observations	399	139	1132	2308
	Panel B: Debt to Total Assets			
Intercept	0.21*** (0.03)	0.24*** (0.06)	0.04*** (0.01)	0.06*** (0.02)
Tangibility	0.18*** (0.05)	0.14** (0.07)	0.16*** (0.02)	0.21*** (0.03)
Logassets	-0.02* (0.01)	0.007 (0.02)	0.04*** (0.006)	0.04*** (0.007)
Profitability	-0.50*** (0.09)	-1.03*** (0.19)	-0.15*** (0.02)	-0.012* (0.006)
Number of observations	399	139	1132	2308

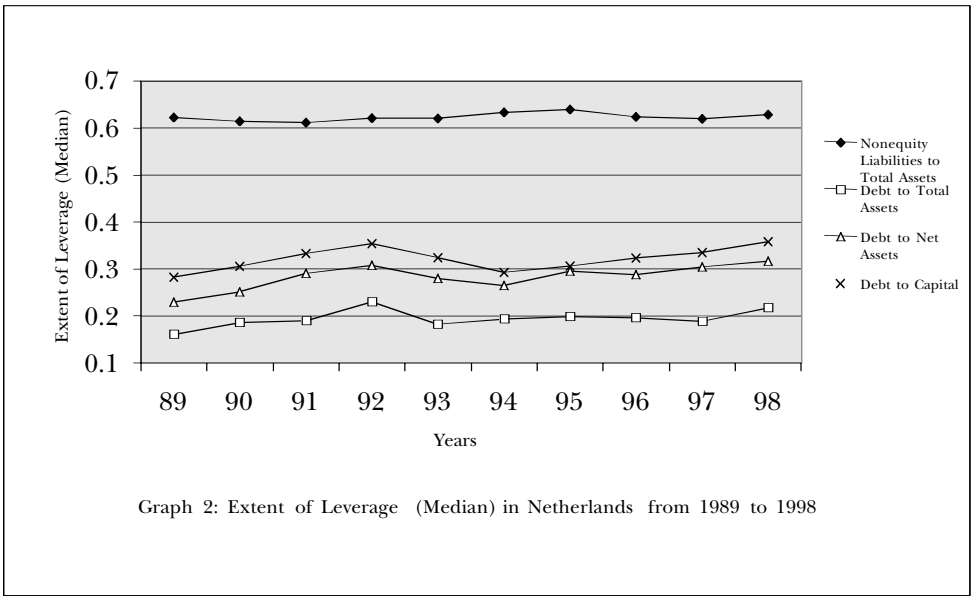
Country Variable	Germany	Netherlands	United Kingdom	United States
		Panel C: Debt to Net Assets		
Intercept	0.28*** (0.04)	0.36*** (0.08)	0.11*** (0.02)	0.10*** (0.02)
Tangibility	0.16*** (0.06)	0.06 (0.10)	0.10*** (0.03)	0.19*** (0.03)
Logassets	-0.02 (0.01)	0.02 (0.02)	0.06*** (0.008)	0.05*** (0.009)
Profitability	-0.70*** (0.11)	-1.42*** (0.27)	-0.20*** (0.04)	-0.018** (0.008)
Number of observations	399	139	1132	2308
		Panel D: Debt to Capital		
Intercept	0.29*** (0.05)	0.33*** (0.08)	0.10*** (0.02)	0.05** (0.02)
Tangibility	0.20*** (0.08)	0.07 (0.11)	0.08*** (0.03)	0.22*** (0.03)
Logassets	0.02 (0.02)	0.05** (0.02)	0.08*** (0.008)	0.08*** (0.009)
Profitability	-1.05*** (0.13)	-1.41*** (0.28)	-0.22*** (0.04)	-0.02** (0.008)
Number of observations	399	139	1132	2308

Source: Global Vantage Database.
*, **, and ***, significant at the 10, 5, and 1 percent level, respectively.

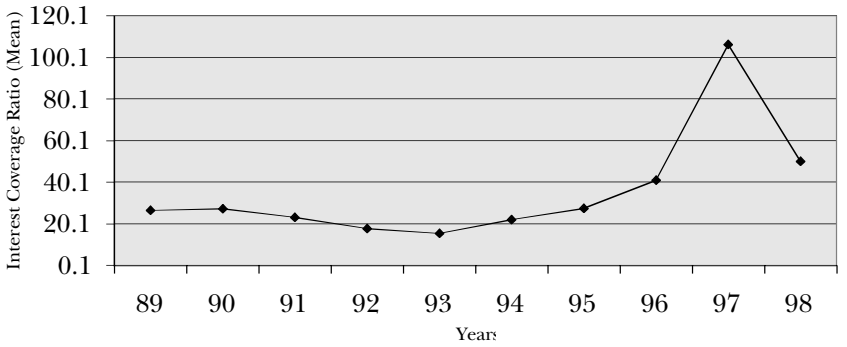
Figure I: Time Series of Leverage Ratios 1989-1998 – The Netherlands



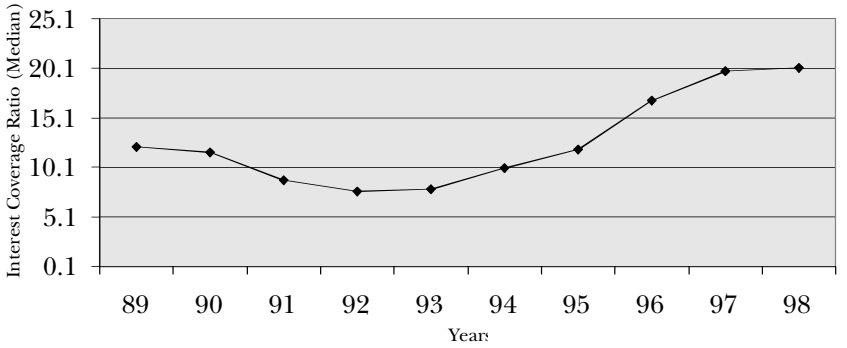
Graph 1: Extent of Leverage (Mean) in Netherlands from 1989 to 1998



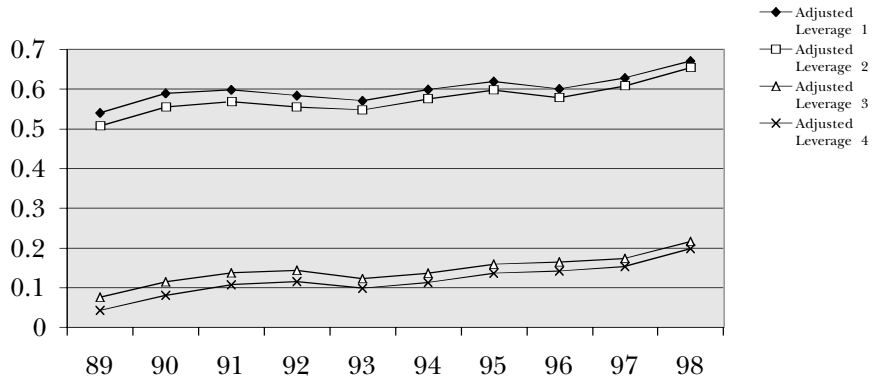
Graph 2: Extent of Leverage (Median) in Netherlands from 1989 to 1998



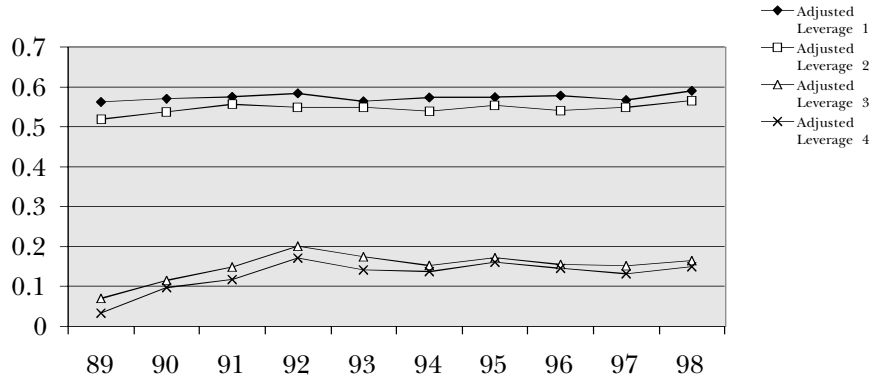
Graph 3: Interest Coverage Ratio (Mean) in Netherlands from 1989 to 1998



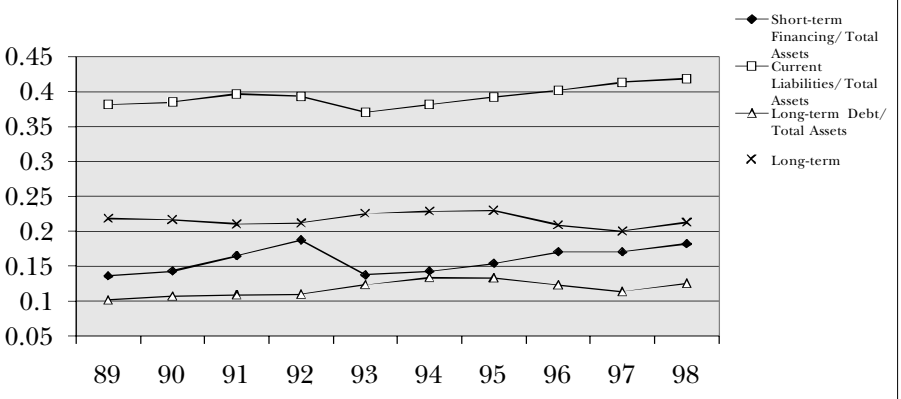
Graph 4: Interest Coverage Ratio (Median) in Netherlands from 1989 to 1998



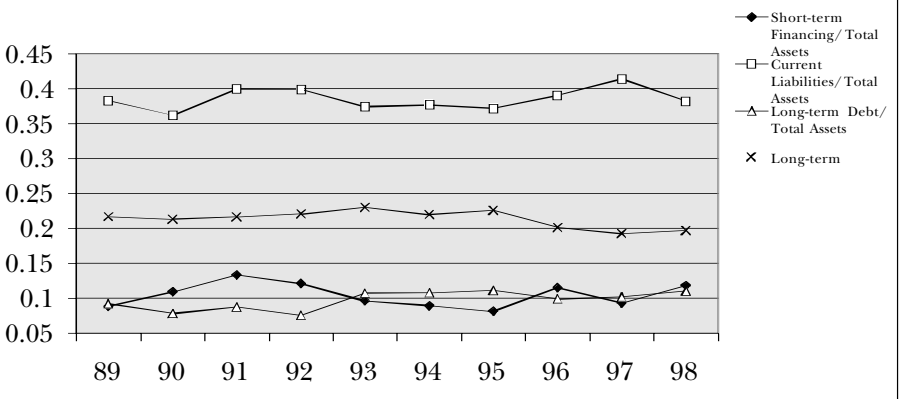
Graph 5: Adjusted Leverages (Mean) in Netherlands from 1989 to 1998



Graph 6: Adjusted Leverages (Median) in Netherlands from 1989 to 1998

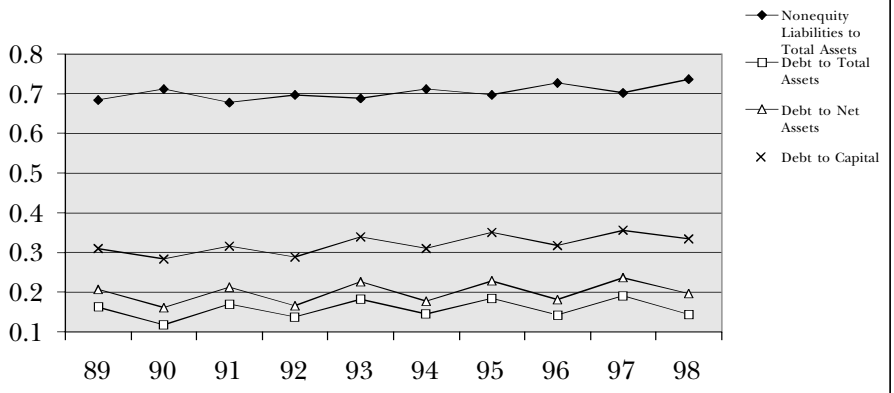


Graph 7: Debt to Total Assets Ratios (Mean) in Netherlands from 1989 to 1998

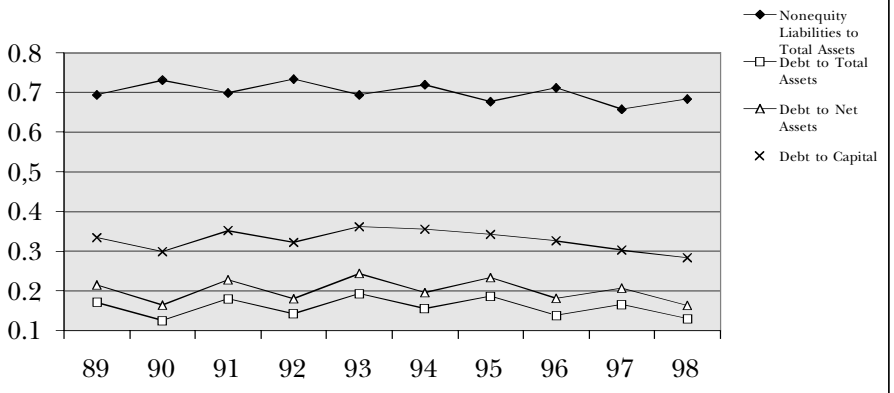


Graph 8: Debt to Total Assets Ratios (Median) in Netherlands from 1989 to 1998

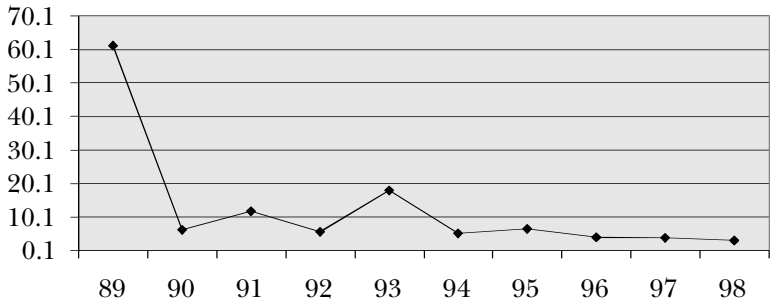
Figure II: Time Series of Leverage Ratios 1989-1998 – Germany



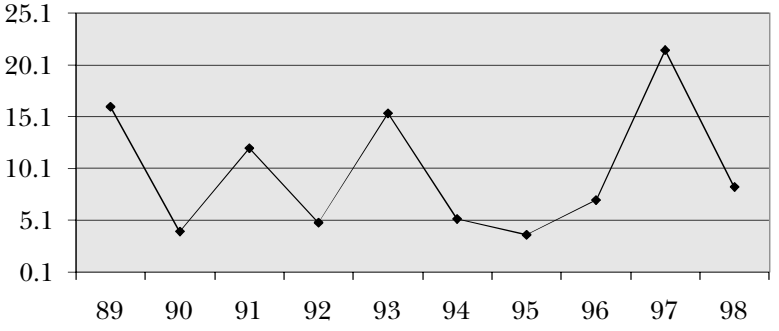
Graph 1: Extent of Leverage (Mean) in Germany from 1989 to 1998



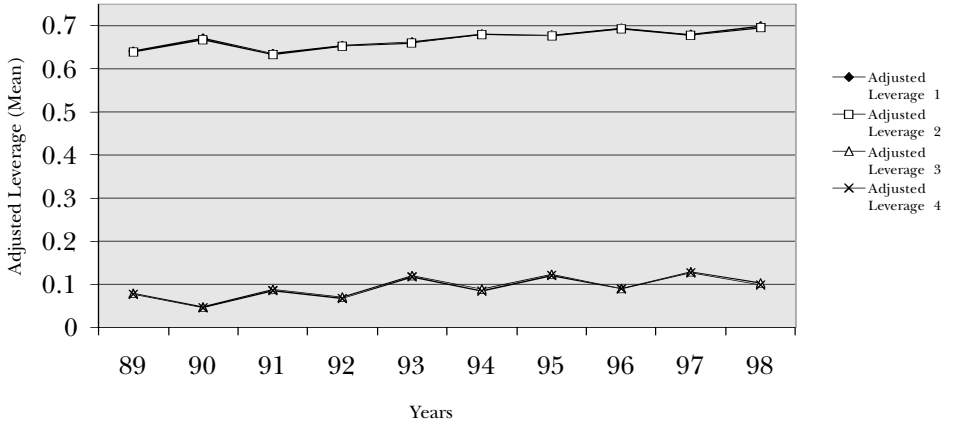
Graph 2: Extent of Leverage (Median) in Germany from 1989 to 1998



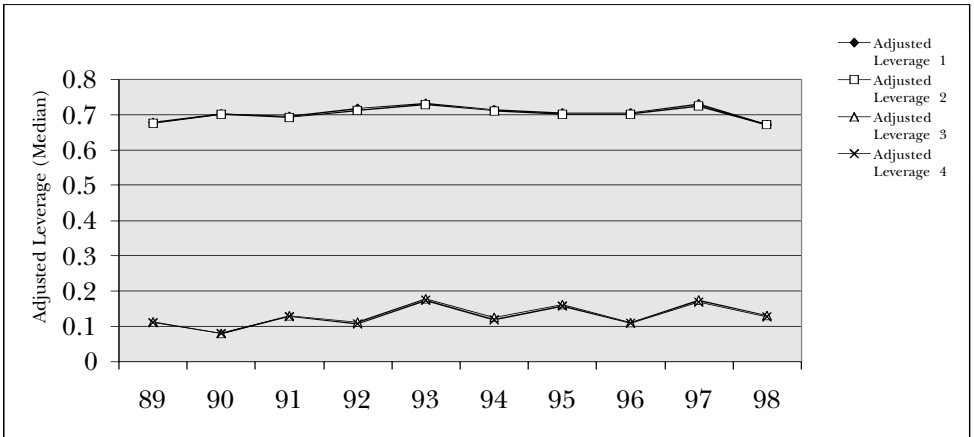
Graph 3: Interest Coverage Ratio (Mean) in Germany from 1989 to 1998



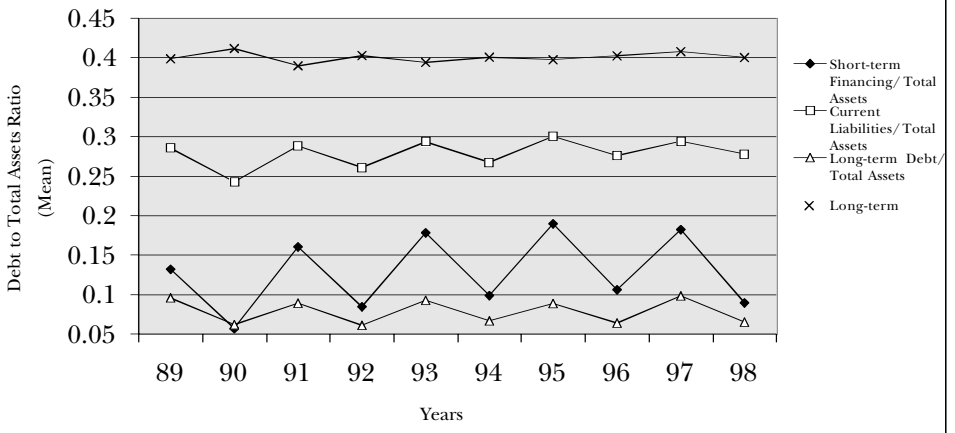
Graph 4: Interest Coverage Ratio (Median) in Germany from 1989 to 1998



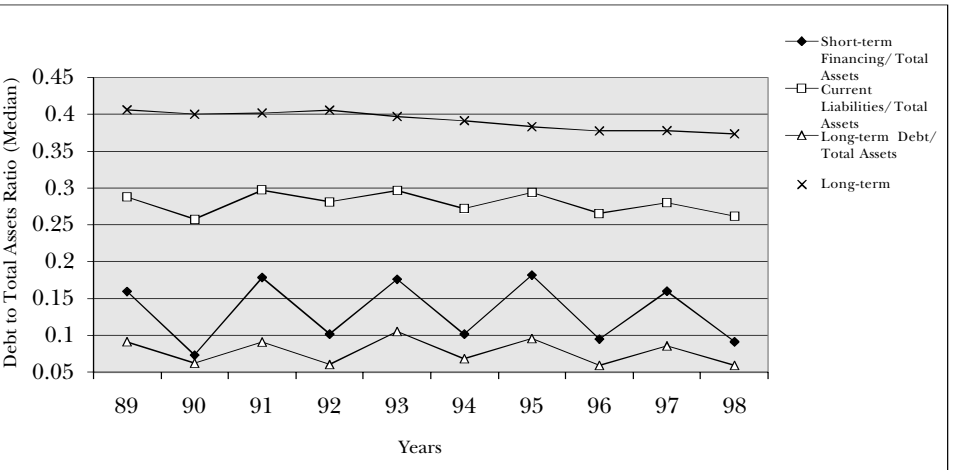
Graph 5: Adjusted Leverages (Mean) in Germany from 1989 to 1998



Graph 6: Adjusted Leverages (Median) in Germany from 1989 to 1998

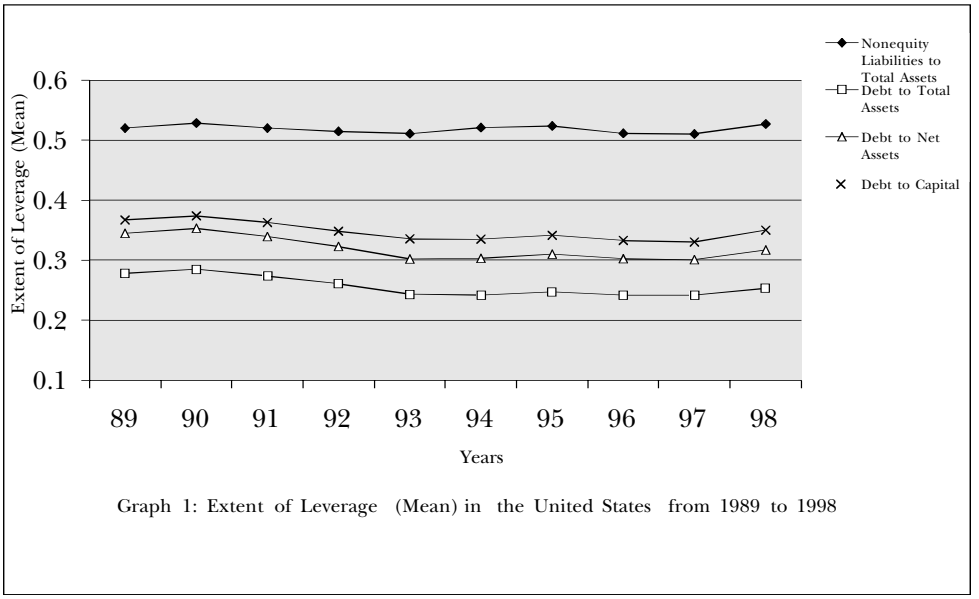


Graph 7: Debt to Total Assets Ratios (Mean) in Germany from 1989 to 1998

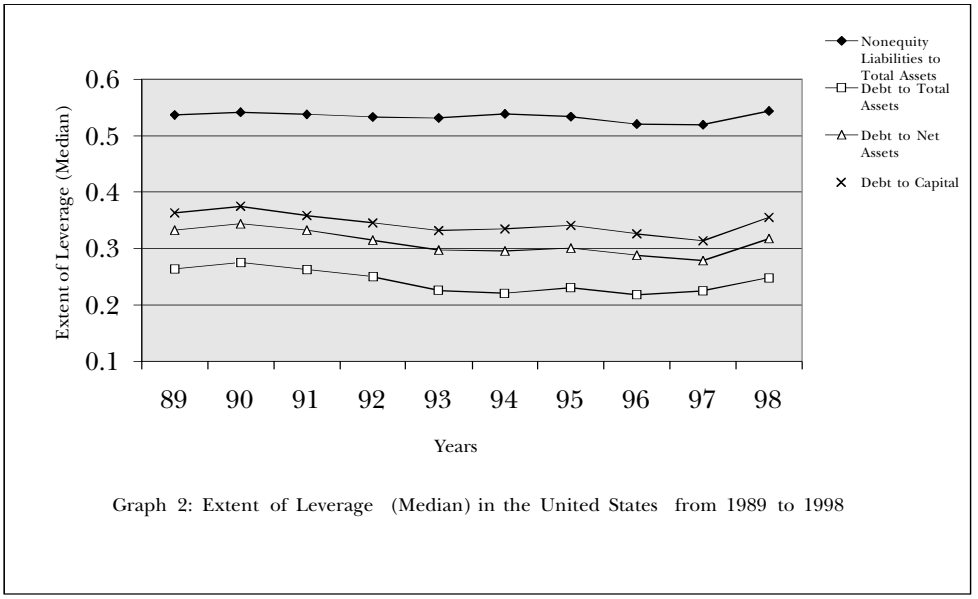


Graph 8: Debt to Total Assets Ratios (Median) in Germany from 1989 to 1998

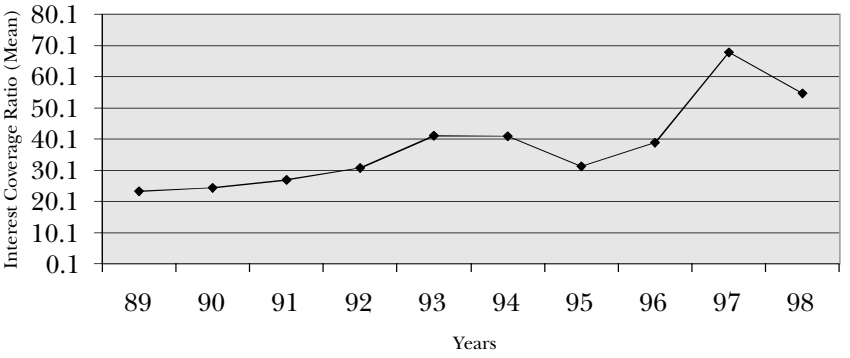
Figure III: Time Series of Leverage Ratios 1989-1998 – United States



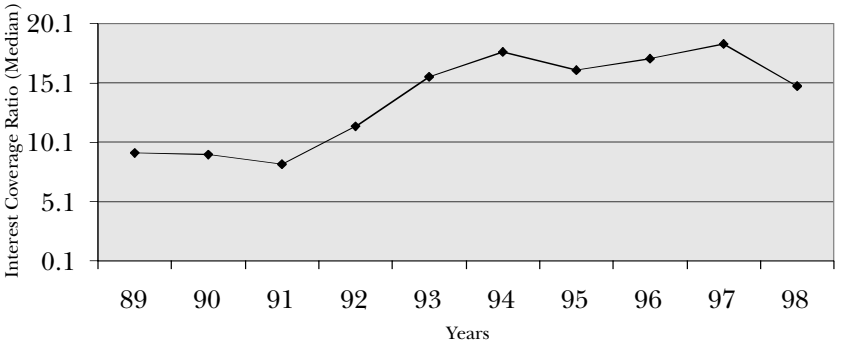
Graph 1: Extent of Leverage (Mean) in the United States from 1989 to 1998



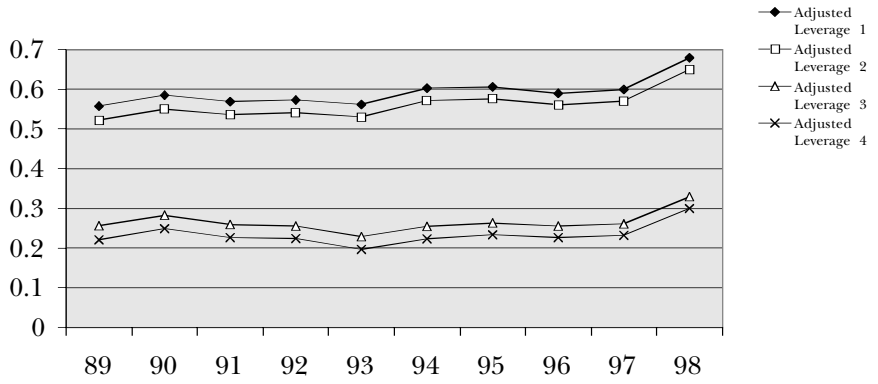
Graph 2: Extent of Leverage (Median) in the United States from 1989 to 1998



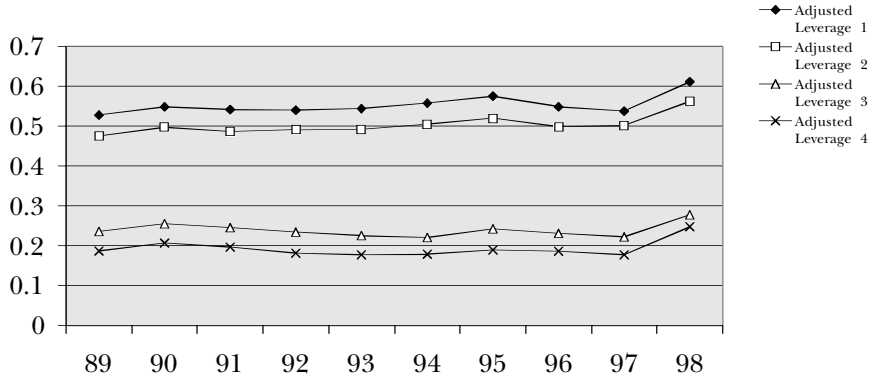
Graph 3: Interest Coverage Ratio (Mean) in the United States from 1989 to 1998



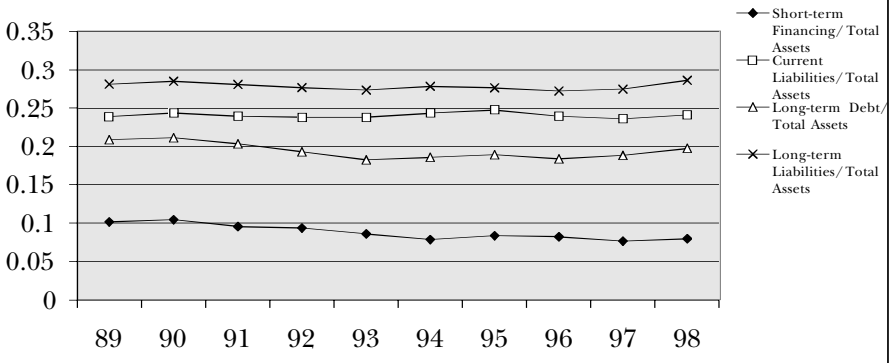
Graph 4: Interest Coverage Ratio (Median) in the United States from 1989 to 1998



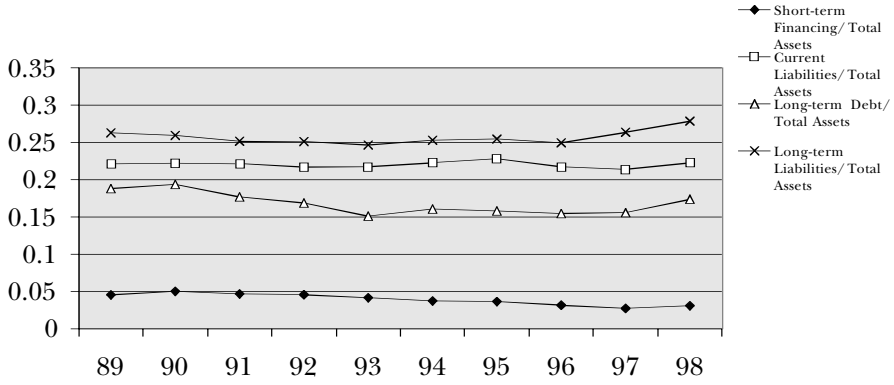
Graph 5: Adjusted Leverages (Mean) in the United States from 1989 to 1998



Graph 6: Adjusted Leverages (Median) in the United States from 1989 to 1998

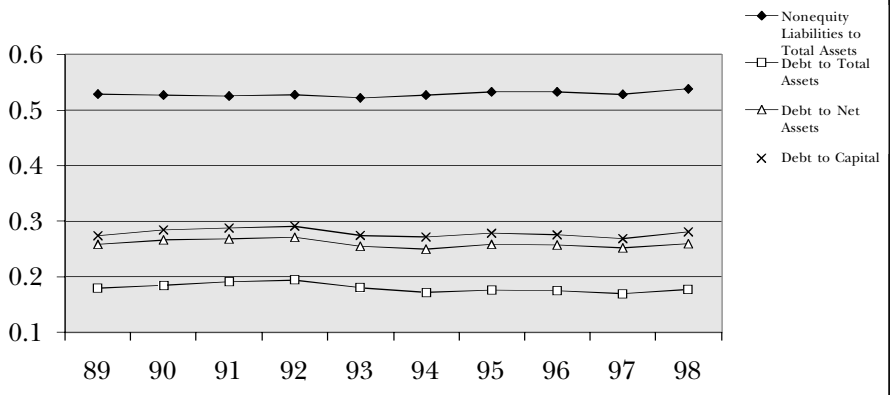


Graph 7: Debt to Total Assets Ratios (Mean) in the United States from 1989 to 1998

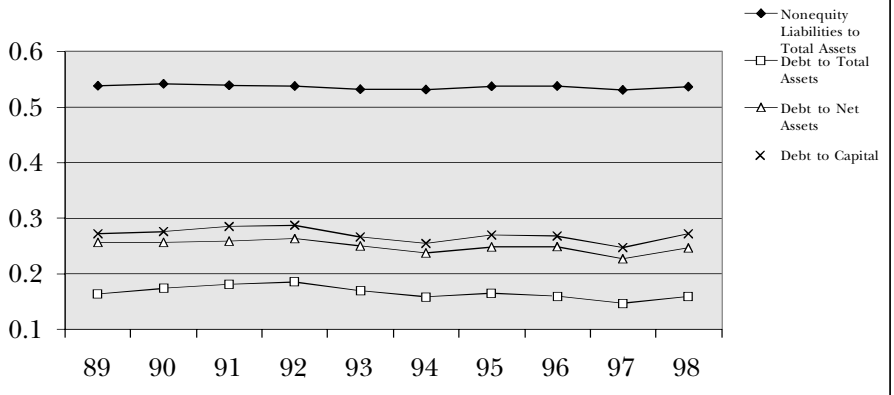


Graph 8: Debt to Total Assets Ratios (Median) in the United States from 1989 to 1998

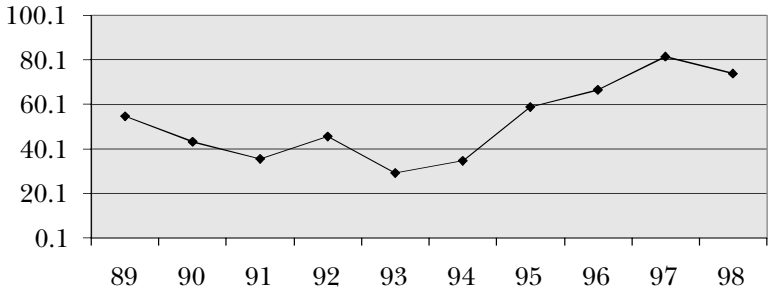
Figure IV: Times Series of Leverage Ratios 1989-1998 – United Kingdom



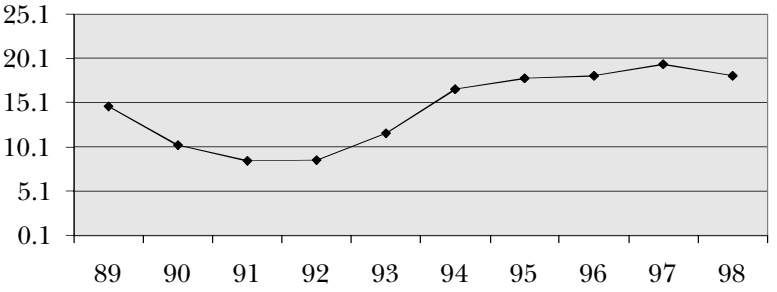
Graph 1: Extent of Leverage (Mean) in the United Kingdom from 1989 to 1998



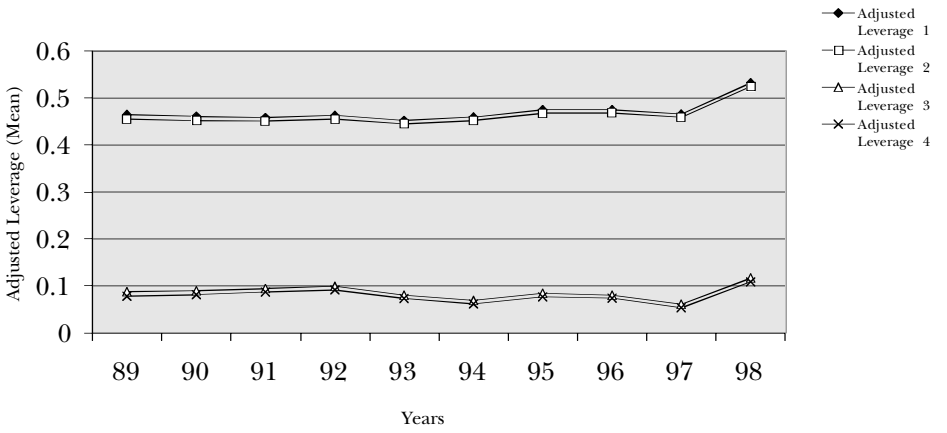
Graph 2: Extent of Leverage (Median) in the United Kingdom from 1989 to 1998



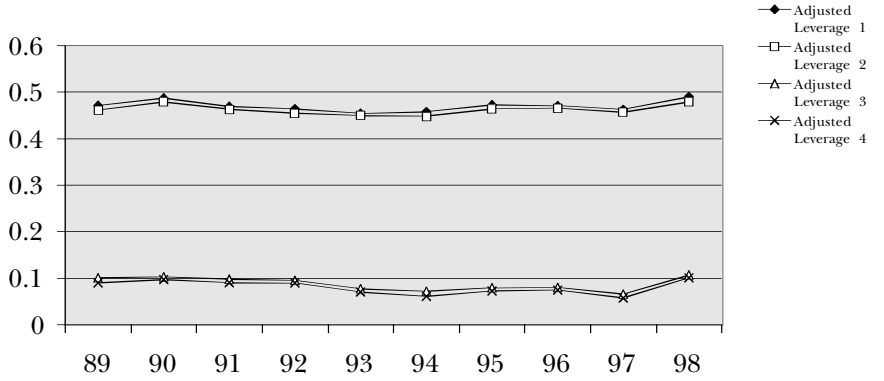
Graph 3: Interest Coverage Ratio (Mean) in the United Kingdom from 1989 to 1998



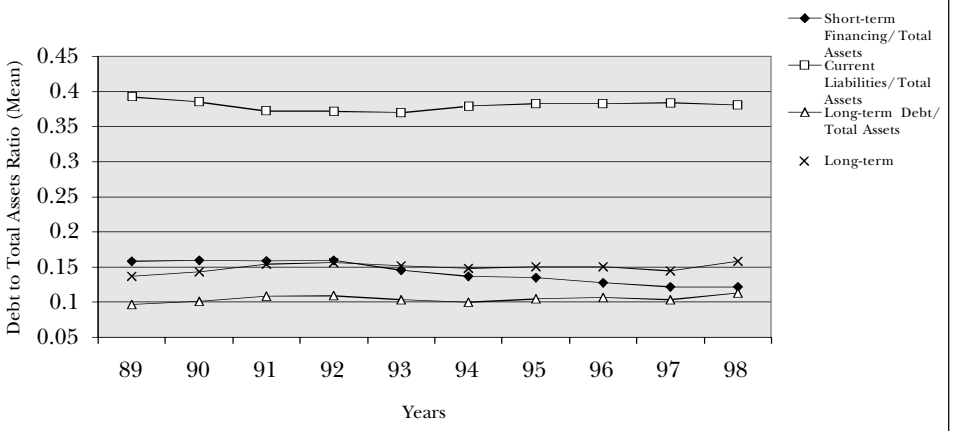
Graph 4: Interest Coverage Ratio (Median) in the United Kingdom from 1989 to 1998



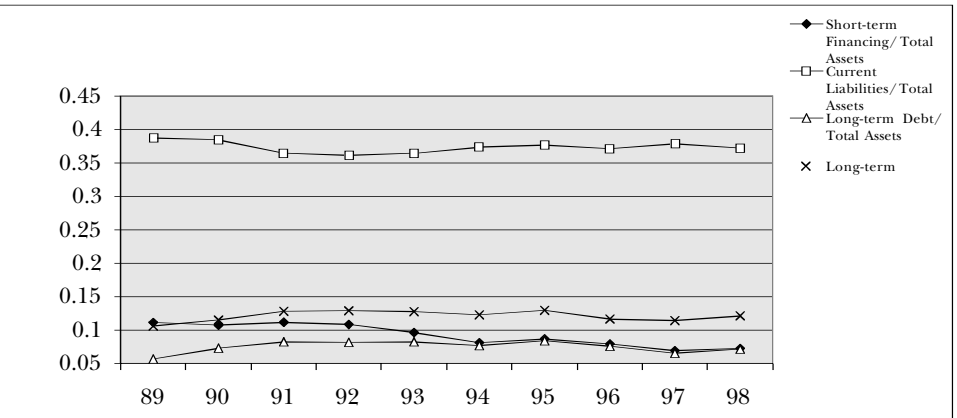
Graph 5: Adjusted Leverages (Mean) in the United Kingdom from 1989 to 1998



Graph 6: Adjusted Leverages (Median) in the United Kingdom from 1989 to 1998



Graph 7: Debt to Total Assets Ratios (Mean) in the United Kingdom from 1989 to 1998



Graph 8: Debt to Total Assets Ratios (Median) in the United Kingdom from 1989 to 1998

Appendix

Table A-I: Balance Sheet for Non-Financial Firms in the US, Germany, The Netherlands, and the UK – 1998

The value of each item is calculated as a fraction of the book value of total assets and then averaged across all firms reporting consolidated balance sheets in the country. Only balance sheets of non-financial firms are included. Firms for which shareholders' equity was negative are excluded

	United States	Germany	United Kingdom	Netherlands
ASSETS				
Cash and short-term investments	11.7	9.6	13.7	10.2
Account receivable/debtors	17.2	22.9	22.8	30.7
Inventories	13.6	18.1	15.1	16.6
Current assets-other	3.8	5.4	3.7	1.8
Current assets – total	45.9	56.1	55.3	59.3
Fixed assets (tangible)	32.6	29.8	37.9	32.6
Investments and advances – equity	1.3	1.1	1.1	1.3
Investment and advances – other	2.2	7.3	1.6	3.3
Intangible assets	9.9	5.5	3.6	2.8
Assets – other	7.5	0.3	0.4	0.7
Assets – total	100.0	100.0	100.0	100.0
LIABILITIES				
Debt in current liabilities	4.0	8.0	6.0	9.1
Accounts payable/creditors	8.5	9.7	13.4	13.3
Current liabilities – other	11.9	10.2	18.5	19.4
Current liabilities – total	24.1	27.9	38.0	41.9
Deferred taxes	2.5	0.5	0.8	1.6
Long-term debt	19.7	8.5	11.2	12.5
Minority interest	0.6	1.3	0.6	0.7
Reserves – untaxed	0	1.7	0.1	0.1
Liabilities – other	5.5	25.8	3.0	6.4
Liabilities – total	52.7	65.7	53.8	63.1
Shareholders equity	47.3	34.3	46.2	36.9
Total liabilities and shareholders equity	100.0	100.0	100	100.0

Source: Global Vantage Database

Table A-IIA: Extent of Leverage and Adjusted Leverage in Netherlands - 1998

Leverage measures are calculated for all non-financial companies reporting consolidated balance sheets in 1997. Both debt and equity are measured at book value. Firms for which shareholders' equity is negative are excluded. In Panel A, Non-equity liabilities to total assets is the sum of all liabilities divided by the book value of total assets. Debt to total assets is the book value of short-term debt plus long-term debt divided by total assets. Debt to net assets is the book value of short-term and long-term debt divided by the book value of net assets, where net assets is equal to total assets minus accounts payable and other current liabilities. Debt to capital is the book value of debt divided by the sum of the book values of debt and equity. Debt to equity is the book value of debt divided by the book value of shareholders' equity. The interest coverage ratio is earnings before interest and taxes (EBIT) divided by interest payments. In Panel B, adjusted assets are total assets less intangibles. Adjusted Leverage 1 is total liabilities less cash plus intangible assets, divided by adjusted assets. Adjusted Leverage 2 is total liabilities less cash and deferred taxes plus intangibles, divided by adjusted assets. Adjusted Leverage 3 is the book value of short-term and long-term debt plus intangibles less cash and short-term investments, divided by adjusted assets. In all our definitions short-term debt is the sum of debt in current liabilities, long-term debt due in one year and other short-term borrowings. Adjusted Leverage 4 is the book value of short-term and long-term debt plus intangibles less cash and short-term investments and deferred taxes, divided by adjusted assets.

Panel A: Extent of Leverage

	Number of Firms	Nonequity Liabilities to Total Assets		Debt to Total Assets		Debt to Net Assets		Debt to Capital		Interest Coverage Ratio	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firms	106	0.63	0.63	0.23	0.22	0.33	0.32	0.36	0.36	50.08	20.12
Top 25% by total assets	27	0.68	0.67	0.26	0.21	0.38	0.31	0.43	0.35	17.11	14.10
Second 25% by total assets	27	0.67	0.69	0.22	0.21	0.34	0.34	0.37	0.40	20.18	17.39
Third 25% by total assets	26	0.60	0.61	0.21	0.19	0.29	0.25	0.31	0.27	29.13	20.12
Bottom 25% by total assets	26	0.58	0.57	0.22	0.23	0.30	0.32	0.32	0.35	136.30	71.49

Panel B: Extent of Adjusted Leverage

	Number of Firms	Adjusted Leverage 1		Adjusted Leverage 2		Adjusted Leverage 3		Adjusted Leverage 4	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firms	106	0.67	0.59	0.65	0.57	0.22	0.16	0.20	0.15
Top 25% by total assets	27	0.98	0.66	0.96	0.64	0.46	0.15	0.44	0.13
Second 25% by total assets	27	0.63	0.65	0.62	0.65	0.13	0.16	0.12	0.15
Third 25% by total assets	26	0.57	0.59	0.55	0.55	0.13	0.13	0.11	0.13
Bottom 25% by total assets	26	0.49	0.50	0.48	0.50	0.13	0.21	0.12	0.18

Source: Global Vantage Database.

Table A-IIIA: Short-Term and Long-Term Debt to Total Assets Ratios in Netherlands - 1998

Debt to total assets ratios are calculated for all non-financial companies reporting consolidated balance sheets in 1998. Firms for which shareholders' equity is negative are excluded. Short-term financing is the sum of debt in current liabilities, long-term debt due in one year, and short-term borrowings.

	Number of Firms	Short-term Financing/ Total Assets		Current Liabilities/ Total Assets		Long-term Debt/ Total Assets		Long-term Liabilities/ Total Assets	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firms	106	0.18	0.12	0.42	0.38	0.13	0.11	0.21	0.20
Top 25% by total assets	27	0.13	0.08	0.38	0.36	0.18	0.15	0.30	0.29
Second 25% by total assets	27	0.20	0.13	0.48	0.49	0.11	0.11	0.19	0.20
Third 25% by total assets	26	0.18	0.13	0.40	0.38	0.11	0.08	0.19	0.18
Bottom 25% by total assets	26	0.21	0.18	0.41	0.38	0.10	0.10	0.17	0.17

Source: Global Vantage Database.

Table A-IIB: Extent of Leverage and Adjusted Leverage in Germany - 1998

Leverage measures are calculated for all non-financial companies reporting consolidated balance sheets in 1997. Both debt and equity are measured at book value. Firms for which shareholders' equity is negative are excluded. In Panel A, Non-equity liabilities to total assets is the sum of all liabilities divided by the book value of total assets. Debt to total assets is the book value of short-term debt plus long-term debt divided by total assets. Debt to net assets is the book value of short-term and long-term debt divided by the book value of net assets, where net assets is equal to total assets minus accounts payable and other current liabilities. Debt to capital is the book value of debt divided by the sum of the book values of debt and equity. Debt to equity is the book value of debt divided by the book value of shareholders' equity. The interest coverage ratio is earnings before interest and taxes (EBIT) divided by interest payments. In Panel B, adjusted assets are total assets less intangibles. Adjusted Leverage 1 is total liabilities less cash plus intangible assets, divided by adjusted assets. Adjusted Leverage 2 is total liabilities less cash and deferred taxes plus intangibles, divided by adjusted assets. Adjusted Leverage 3 is the book value of short-term and long-term debt plus intangibles less cash and short-term investments, divided by adjusted assets. In all our definitions short-term debt is the sum of debt in current liabilities, long-term debt due in one year and other short-term borrowings. Adjusted Leverage 4 is the book value of short-term and long-term debt plus intangibles less cash and short-term investments and deferred taxes, divided by adjusted assets.

Panel A: Extent of Leverage

	Number of Firms	Nonequity Liabilities to Total Assets		Debt to Total Assets		Debt to Net Assets		Debt to Capital		Interest Coverage Ratio	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firms	189	0.66	0.68	0.17	0.13	0.21	0.16	0.30	0.28	21.51	8.28
Top 25% by total assets	47	0.71	0.74	0.13	0.11	0.16	0.14	0.30	0.27	6.51	4.96
Second 25% by total assets	47	0.69	0.70	0.12	0.07	0.16	0.08	0.25	0.18	7.15	5.93
Third 25% by total assets	47	0.62	0.60	0.19	0.18	0.24	0.22	0.33	0.33	17.20	12.75
Bottom 25% by total assets	48	0.61	0.63	0.22	0.20	0.27	0.25	0.34	0.33	54.48	14.28

Panel B: Extent of Adjusted Leverage

	Number of Firms	Adjusted Leverage 1		Adjusted Leverage 2		Adjusted Leverage 3		Adjusted Leverage 4	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firms	189	0.73	0.67	0.73	0.67	0.17	0.13	0.17	0.13
Top 25% by total assets	47	0.80	0.77	0.79	0.77	0.12	0.13	0.11	0.12
Second 25% by total assets	47	0.66	0.64	0.66	0.64	0.05	0.01	0.04	0.005
Third 25% by total assets	47	0.85	0.62	0.85	0.62	0.33	0.17	0.32	0.17
Bottom 25% by total assets	48	0.62	0.63	0.61	0.63	0.20	0.19	0.19	0.19

Source: Global Vantage Database.

Table A-IIIB: Short-Term and Long-Term Debt to Total Assets Ratios in Germany - 1998

Debt to total assets ratios are calculated for all non-financial companies reporting consolidated balance sheets in 1998. Firms for which shareholders' equity is negative are excluded. Short-term financing is the sum of debt in current liabilities, long-term debt due in one year, and short-term borrowings.

	Number of Firms	Short-term Financing/ Total Assets		Current Liabilities/ Total Assets		Long-term Debt/ Total Assets		Long-term Liabilities/ Total Assets	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firms	189	0.16	0.09	0.28	0.26	0.09	0.06	0.38	0.37
Top 25% by total assets	47	0.10	0.07	0.24	0.23	0.08	0.07	0.48	0.48
Second 25% by total assets	47	0.12	0.04	0.26	0.23	0.06	0.04	0.42	0.45
Third 25% by total assets	47	0.18	0.16	0.29	0.26	0.10	0.06	0.33	0.32
Bottom 25% by total assets	48	0.23	0.15	0.32	0.32	0.10	0.09	0.29	0.29

Source: Global Vantage Database.

Table A-IIC: Extent of Leverage and Adjusted Leverage in the United States - 1998

Leverage measures are calculated for all non-financial companies reporting consolidated balance sheets in 1998. Both debt and equity are measured at book value. Firms for which shareholders' equity is negative are excluded. In Panel A, Non-equity liabilities to total assets is the sum of all liabilities divided by the book value of total assets. Debt to total assets is the book value of short-term debt plus long-term debt divided by total assets. Debt to net assets is the book value of short-term and long-term debt divided by the book value of net assets, where net assets is equal to total assets minus accounts payable and other current liabilities. Debt to capital is the book value of debt divided by the sum of the book values of debt and equity. Debt to equity is the book value of debt divided by the book value of shareholders' equity. The interest coverage ratio is earnings before interest and taxes (EBIT) divided by interest payments. In Panel B, adjusted assets are total assets less intangibles. Adjusted Leverage 1 is total liabilities less cash plus intangible assets, divided by adjusted assets. Adjusted Leverage 2 is total liabilities less cash and deferred taxes plus intangibles, divided by adjusted assets. Adjusted Leverage 3 is the book value of short-term and long-term debt plus intangibles less cash and short-term investments, divided by adjusted assets. In all our definitions short-term debt is the sum of debt in current liabilities, long-term debt due in one year and other short-term borrowings. Adjusted Leverage 4 is the book value of short-term and long-term debt plus intangibles less cash and short-term investments and deferred taxes, divided by adjusted assets.

Panel A: Extent of Leverage

	Number of Firms	Nonequity Liabilities to Total Assets		Debt to Total Assets		Debt to Net Assets		Debt to Capital		Interest Coverage Ratio	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firms	915	0.53	0.54	0.25	0.25	0.32	0.32	0.35	0.35	54.68	14.83
Top 25% by total assets	229	0.59	0.61	0.27	0.25	0.34	0.33	0.40	0.39	16.65	11.17
Second 25% by total assets	229	0.51	0.53	0.23	0.24	0.28	0.30	0.32	0.33	32.23	17.28
Third 25% by total assets	229	0.52	0.52	0.26	0.25	0.33	0.34	0.35	0.36	24.68	15.21
Bottom 25% by total assets	228	0.48	0.49	0.25	0.24	0.32	0.31	0.33	0.32	145.56	15.58

Panel B: Extent of Adjusted Leverage

	Number of Firms	Adjusted Leverage 1		Adjusted Leverage 2		Adjusted Leverage 3		Adjusted Leverage 4	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firms	915	0.68	0.61	0.65	0.56	0.33	0.28	0.30	0.25
Top 25% by total assets	229	0.78	0.69	0.74	0.62	0.36	0.29	0.32	0.24
Second 25% by total assets	229	0.68	0.62	0.65	0.58	0.32	0.28	0.29	0.25
Third 25% by total assets	229	0.72	0.57	0.69	0.54	0.38	0.28	0.35	0.26
Bottom 25% by total assets	228	0.54	0.51	0.52	0.49	0.26	0.26	0.24	0.23

Source: Global Vantage Database.

Table A-IIIC: Short-Term and Long-Term Debt to Total Assets Ratios in the United States - 1998

Debt to total assets ratios are calculated for all non-financial companies reporting consolidated balance sheets in 1998. Firms for which shareholders' equity is negative are excluded. Short-term financing is the sum of debt in current liabilities, long-term debt due in one year, and short-term borrowings.

	Number of Firms	Short-term Financing/ Total Assets		Current Liabilities/ Total Assets		Long-term Debt/ Total Assets		Long-term Liabilities/ Total Assets	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firms	915	0.08	0.03	0.24	0.20	0.20	0.17	0.29	0.28
Top 25% by total assets	229	0.09	0.05	0.26	0.24	0.21	0.19	0.34	0.34
Second 25% by total assets	229	0.07	0.02	0.23	0.21	0.19	0.17	0.28	0.27
Third 25% by total assets	229	0.08	0.03	0.24	0.22	0.21	0.18	0.28	0.28
Bottom 25% by total assets	228	0.09	0.02	0.24	0.21	0.19	0.13	0.24	0.21

Source: Global Vantage Database.

Table A-IID: Extent of Leverage and Adjusted Leverage in the United Kingdom - 1998

Leverage measures are calculated for all non-financial companies reporting consolidated balance sheets in 1998. Both debt and equity are measured at book value. Firms for which shareholders' equity is negative are excluded. In Panel A, Non-equity liabilities to total assets is the sum of all liabilities divided by the book value of total assets. Debt to total assets is the book value of short-term debt plus long-term debt divided by total assets. Debt to net assets is the book value of short-term and long-term debt divided by the book value of net assets, where net assets is equal to total assets minus accounts payable and other current liabilities. Debt to capital is the book value of debt divided by the sum of the book values of debt and equity. Debt to equity is the book value of debt divided by the book value of shareholders' equity. The interest coverage ratio is earnings before interest and taxes (EBIT) divided by interest payments. In Panel B, adjusted assets are total assets less intangibles. Adjusted Leverage 1 is total liabilities less cash plus intangible assets, divided by adjusted assets. Adjusted Leverage 2 is total liabilities less cash and deferred taxes plus intangibles, divided by adjusted assets. Adjusted Leverage 3 is the book value of short-term and long-term debt plus intangibles less cash and short-term investments, divided by adjusted assets. In all our definitions short-term debt is the sum of debt in current liabilities, long-term debt due in one year and other short-term borrowings. Adjusted Leverage 4 is the book value of short-term and long-term debt plus intangibles less cash and short-term investments and deferred taxes, divided by adjusted assets.

Panel A: Extent of Leverage

	Number of Firms	Nonequity Liabilities to Total Assets		Debt to Total Assets		Debt to Net Assets		Debt to Capital		Interest Coverage Ratio	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firms	912	0.54	0.54	0.18	0.16	0.26	0.25	0.28	0.27	73.93	18.11
Top 25% by total assets	228	0.60	0.60	0.23	0.22	0.32	0.32	0.36	0.35	15.87	10.04
Second 25% by total assets	228	0.50	0.49	0.13	0.10	0.19	0.15	0.21	0.16	18.71	13.69
Third 25% by total assets	228	0.53	0.52	0.17	0.15	0.25	0.23	0.26	0.25	34.45	24.20
Bottom 25% by total assets	228	0.52	0.52	0.18	0.17	0.27	0.25	0.28	0.26	227.68	75.66

Panel B: Extent of Adjusted Leverage

	Number of Firms	Adjusted Leverage 1		Adjusted Leverage 2		Adjusted Leverage 3		Adjusted Leverage 4	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firms	912	0.53	0.49	0.52	0.48	0.12	0.11	0.11	0.10
Top 25% by total assets	228	0.62	0.57	0.61	0.56	0.15	0.13	0.14	0.12
Second 25% by total assets	228	0.39	0.40	0.39	0.40	-0.03	-0.02	-0.04	-0.03
Third 25% by total assets	228	0.54	0.46	0.53	0.45	0.14	0.12	0.13	0.11
Bottom 25% by total assets	228	0.57	0.51	0.56	0.50	0.20	0.14	0.20	0.14

Source: Global Vantage Database.

Table A-IIID: Short-Term and Long-Term Debt to Total Assets Ratios in the United Kingdom - 1998

Debt to total assets ratios are calculated for all non-financial companies reporting consolidated balance sheets in 1998. Firms for which shareholders' equity is negative are excluded. Short-term financing is the sum of debt in current liabilities, long-term debt due in one year, and short-term borrowings.

	Number of Firms	Short-term Financing/ Total Assets		Current Liabilities/ Total Assets		Long-term Debt/ Total Assets		Long-term Liabilities/ Total Assets	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firms	912	0.12	0.07	0.38	0.37	0.11	0.07	0.16	0.12
Top 25% by total assets	228	0.11	0.07	0.36	0.33	0.17	0.14	0.24	0.23
Second 25% by total assets	228	0.09	0.03	0.37	0.36	0.08	0.03	0.13	0.08
Third 25% by total assets	228	0.12	0.07	0.39	0.40	0.10	0.05	0.14	0.10
Bottom 25% by total assets	228	0.16	0.12	0.41	0.41	0.09	0.06	0.12	0.09

Source: Global Vantage Database.

2 The Capital Structure and Funding Source Choices of Small and Large Firms in the Netherlands*

2.1 Introduction

In the previous chapter we gave an overview of the relative importance of financial markets (equity and bond markets) and banks as financing sources for firms in the US, the UK, Germany and the Netherlands, and compared the capital structure choices of large, publicly traded non-financial firms in the different countries for the year 1997 and the period 1989-1998, based on the Global Vantage database.

In this chapter, we analyze the financing behavior of Dutch non-financial firms in the past decade (1992-1999) in more detail, and further examine the role of banks, financial markets and other capital suppliers in the provision of financing to firms in the Netherlands. In order to document the capital structure decisions of Dutch firms, we use the Reach database (Bureau van Dijk), which contains standardized financial statement information for all registered corporations in the Netherlands. The use of Reach data allows us to include both publicly traded and private firms in our analysis, and to make distinctions based on firm size (both in terms of the value of total assets and the number of employees) and firm maturity. The non-financial firms in our sample were selected based on SIC and BIK codes.[1] Since the Reach database does not incorporate the date of first listing for firms that are traded at the Amsterdam Stock Exchange (now Euronext), we matched the Reach data with listing (and delisting) date information obtained from the Amsterdam Stock Exchange in order to obtain our sample.[2] Like the Global Vantage database, the Reach database only contains book value information. Our findings therefore should be interpreted carefully.[3]

Information on the main financing sources for Dutch corporations was obtained from aggregate CBS and OECD statistics, in particular the 'CBS Time Series for Non-Financial Firms' and the 'OECD Financial Statements of Non-Financial Enterprises'. We use aggregate statistics, since no existing database contains information on financing sources on the individual firm level for Dutch corporations.[4]

Our principal objective in this chapter is to provide comprehensive and up-to-date information on the capital structures of a broader spectrum of firms in the Netherlands. Although several interesting previous studies address the financing behavior of Dutch

* We thank Pim Schram for valuable research assistance.

1 Since the SIC and BIK codes in the Reach database have not yet been standardized in a satisfactory manner (and therefore SIC codes could not filter out all financial firms), both were used to obtain our selection of non-financial firms.

2 This matching with date of first listing is necessary, since Reach classifies firms that are listed at the moment of data selection (March 2001) as listed for the whole sample period (1993-1999), and vice versa for private firms.

3 A conversion to market values of debt and equity using stock and/or bond prices would obviously be preferable. Such a conversion would only be feasible for firms that have issued publicly traded stocks and/or bonds. Given the large number of private firms, and the small number of publicly listed firms that have issued corporate bonds in the Netherlands, such an exercise is expected to render very limited additional insights. We use book values for all firms in order to compare the underlying capital structure positions of firms with publicly traded equity (i.e., firms for which market prices of equity are available), with those of firms with non-traded equity (i.e., firms for which market prices of equity are not available).

4 Ideally, part of this information could be obtained from banks, but information on individual loans is generally considered confidential.

firms (see e.g. Cools, 1993, De Haan, 1997, and De Jong, 1999), none of the recent studies incorporates descriptive statistics based on individual firm information beyond overall debt (leverage) ratios for listed firms, or extends beyond the first half of the nineties. In this chapter, we report stylized facts regarding the relative leverage ratios of publicly traded and private firms (including a breakdown in short-term and long-term debt financing) for the period 1992-1999, and examine how these ratios vary with firm size and firm maturity (life-cycle effects).

The organization of this chapter is as follows. Section 2.2 presents the capital structure choices of publicly traded firms. Section 2.3 focuses on the leverage decisions of private firms, with a particular emphasis on smaller firms. Section 2.4 contains an analysis of the capital structure of publicly traded and private firms as a function of firm maturity (life cycle effects). Section 2.5 focuses on the supply side of the capital market, and discusses the role of banks, bond and stock markets, and other capital suppliers in the funding of Dutch corporations. Section 2.6 concludes.

2.2 The Capital Structure of Publicly Traded Firms

The capital structure information of all non-financial firms that during the period 1993-1999 at any time were listed and traded at the Amsterdam Stock Exchange is incorporated in the *Tables I* through *VI*. The tables only include firms for which consolidated balance sheet information was available in the Reach database for any of the years in which they were listed.

Table I and *Table II* present the debt to total assets ratios (debt ratios) and the debt to capital ratios for the whole sample of listed firms in book value terms, and a breakdown of these aggregate leverage ratios in asset-size quartiles (based on the book value of total assets). *Table I* shows that the debt to asset ratios of listed firms have been relatively stable throughout the 1993-1999 period, with a mean debt ratio varying from a low of 0.51 to a high of 0.56. When broken down in asset-size quartiles, the debt ratios appear to be fairly similar as well, with no obvious pattern as to whether larger or smaller listed firms have higher or lower book value debt ratios (although the debt ratios of the larger listed firms seem to have slightly increased relative to those of the smaller listed firms in the second half of the sample period). The debt to capital ratios in *Table II* show a similar pattern, with slightly higher debt to capital ratios for larger listed firms relative to smaller listed firms.[5]

Observe that the debt ratios and debt to capital ratios presented in *Table I* and *Table II* are higher than those reported in our previous chapter. This is due to differences in accounting conventions and accounting definitions, in particular the definition of short-term debt used in the Global Vantage respectively and the Reach database. In the Global Vantage database, short-term debt includes only debt in current liabilities and the current portion of long-term debt, whereas short-term debt in the Reach database also includes working capital items, such as accounts payable and other current liabili-

5 These findings are consistent with De Jong (1999), who documents a mean debt ratio of 0.513 (median 0.526) for a sample of listed firms in the period 1992-1996. De Jong furthermore reports a mean long-term debt ratio of 0.161 (median 0.142) and a mean short-term debt ratio of 0.352 (median 0.363).

ties.[6] Observe also that the number of listed firms included in our Reach sample may differ from that in the Global Vantage database, due to differences in availability of financial statement information. The samples therefore are similar, but not completely identical. Taking this into account, however, our results are consistent with our findings from the Global Vantage database in the previous chapter. The leverage ratios – correcting for differences in the definition of short-term debt – are comparable, and larger firms appear to have slightly higher leverage ratios.

The *Tables III, IV, V* and *VI* break down the aggregate debt ratios and debt to capital ratios into their short-term and long-term components, both for the whole sample and for the asset-size quartiles. *Table III* and *Table IV* show that the firms in our sample rely heavily on short-term debt. The mean short-term debt ratio is fairly constant over the period 1993-1999, and lies between 0.40 and 0.44 (which, on average, reflects more than 3/4 of the total use of debt). Interestingly, the very largest asset-size quartile (the top 25% of firms, measured in terms of total assets) appears to use significantly less short-term debt than the remaining three asset-size quartiles. This is consistent with a lower reliance of larger listed firms on short-term bank (current account) financing. These findings are again similar to our insights from the Global Vantage database. *Table V* and *Table VI* show the mirror image. The mean long-term debt ratios of the firms in our sample lie between 0.11 and 0.13, with firms in the largest asset-size quartile using significantly more long-term debt than firms in the remaining asset-size quartiles. As can be seen from *Table V*, the long-term debt ratios of the largest 25% of firms seem to have increased over the last three to five years, while the long-term debt ratios for the smallest 25% have fallen. For example, in 1999 the long-term debt to assets ratio for the largest asset-size quartile was 0.21, compared to 0.06 for the smallest quartile. This may well reflect an increased ease of access for the largest Dutch companies to domestic and international bond markets (including the Eurobond market) in the second half of the nineties, partly due to the integration of capital markets in Europe (see also Ligterink and Schmeits, 1998, and Chapter 1).

2.3 The Capital Structure of Private Firms

The sample of private non-financial firms includes all registered, non-listed non-financial firms with a book value of total assets larger than Dfl. 35,000 ($15,000), for which consolidated financial statement information was available in any year during the period 1992-1999[7]. We split the total sample of private firms in two subsamples, based on their number of employees: (*i*) private firms with 10-50 employees ('smaller private firms'), and (*ii*) private firms with 50-100 employees ('larger private firms').[8] The capital struc-

6 The Reach database does not allow us to easily separate these working capital items out of the short-term debt figures for the whole sample, since breakdowns of short-term debt are not available for all firms. However, ad hoc comparisons of a selection of firms that are included in both the Global Vantage and the Reach databases suggest that the differences in leverage ratios found between this chapter and the previous chapter are mainly attributable to the difference in the definition of short-term debt.

7 For firms with a book value of total assets lower than $15,000, financial statement information was generally not available.

8 We have not included private firms with more than 100 employees in our analysis. As will be discussed later, the

ture information for the private firms with 10-50 employees is presented in the *Tables VII* through *XII*, the capital structure information for firms with 50-100 employees is captured in the *Tables XIII* through *XVIII* and Table XX. For both subsamples, aggregate leverage ratios and breakdowns in asset-size quartiles and long-term and short-term debt are reported.[9]

2.3.1 Private Firms with 10-50 Employees

Table VII shows that the debt to asset ratios of private firms with 10-50 employees varied between a low of 0.64 and a high of 0.77 during the period 1992-1999. The leverage ratios of these 'smaller private firms' are on average 10-20% higher than those of publicly traded firms (see also *Table VIII*). Part of the variability in leverage ratios can be explained by the smaller number of firms in the Reach sample relative to listed firms. From these tables it is also evident that the smallest asset-size quartile of the 'smaller private firms' had higher leverage ratios relative to the other quartiles in the first half of our sample period, but showed lower leverage in comparison to the second and third quartiles in the period 1996-1999. The largest quartile of the smaller firms had the lowest leverage. A potential explanation for the lower use of debt for the smallest firms in the last 5 years could be the rise in technology firms, whose knowledge-sensitive assets are harder to collateralize and whose intrinsic risks are large (see also the Bureau Bartels Report, 1999). To the extent that in the 1995-1999 period more technology firms went public, this might also explain the lower use of (long-term) debt financing of the smallest asset-size quartile of listed firms in this period.[10]

The *Tables IX* through *XII* present a breakdown in short-term and long-term leverage ratios for both the whole sample of firms and the asset-size quartiles. As was the case for the large listed firms, the predominant source of debt financing for the 'smaller private firms' is short-term debt, with mean short-term debt ratios varying between 0.52 and 0.59. These short-term debt ratios are on average 10-20% higher than those of listed firms (and comprise, on average, around 4/5 of the total use of debt). Another stark difference is that the short-term debt ratios of the smallest asset-size quartile of 'smaller private firms' are roughly between 1 ½ and 3 times larger than those of the largest asset-size quartile, although these differences seem to have narrowed a bit in more recent years. This again points at a greater reliance of smaller firms on short-term financing, such as current account loans. From the *Tables XI* and *XII* it can be seen that the mean long-term debt ratios of private firms with 10-50 employees have varied between 0.11 and 0.20 (with a decreasing trend in the first half of the nineties), and thus are comparable with those of large listed firms. During the period 1992-1999, long-term debt appears to have been

leverage ratios of these firms (the 'largest private firms') can be expected to more closely resemble those of publicly traded firms. Furthermore, since very little recent evidence is available with respect to small firm financing in the Netherlands, our focus in this chapter is to gain a better understanding of the financing choices of 'smaller private firms'. The 'micro-firms' with less than 10 employees were also excluded from our sample, due to lack of availability of data. Observe that our definition of a 'smaller private firm' corresponds with those used in other countries, e.g. the UK (see also Chapter 4 of this study).

9 The average book value of total assets for the subsample of firms with 50-100 employees is larger the average book value of assets for the subsample with 10-50 employees.

10 See also de Haas, Houben, Kakes and Korthorst (2000).

mainly held by the largest asset-size quartile. For example, in 1999 the long-term debt ratio of the largest and the smallest asset-size quartile equaled 0.28 and 0.03 respectively, relative to an overall ratio of 0.13. These findings seem to imply that access to significant amounts of long-term debt financing for the smallest of the 'smaller private firms' is limited, and could point at a potential friction in the functioning of the market. That is, while banks may be willing to provide term loans to the largest of their small customers, they may ration the availability of such financing to their very smallest customers.[11] The data also suggest that there may be a critical asset size for 'smaller' firms above which they significantly shift their maturity structure from short-term debt to longer-term debt.

2.3.2 Private Firms with 50-100 Employees

As can be seen from the *Tables XIII* and *XIV*, increasing employee size to a slightly higher cohort of 50-100 employees has significant implications for overall leverage ratios. During the period 1992-1999, the mean debt to asset ratios of private firms with 50-100 employees ranged from 0.58 to 0.61. The debt ratios of larger private firms (or 'mid-size' firms) therefore lie between those of the smaller private firms and the larger listed firms. Interestingly, the leverage ratios for private firms with 50-100 employees are relatively insensitive to asset size. That is, the difference in leverage ratios between the smallest and the largest asset-size quartiles of firms with 50-100 employees are quite small. This suggests more homogeneity for this group of firms than for the smaller private firms.

A breakdown in short-term and long-term leverage ratios presents a similar pattern as before (see the *Tables XV* and *XVI*). As was the case for publicly traded firms and smaller private firms, larger private firms rely heavily on short-term debt (and, with short term debt representing, on average, 5/6 of the total use of debt, are comparable to the smaller private firms). For example, in 1999 the mean debt to assets ratio was 0.61, with a mean short-term debt ratio of 0.49. The short-term debt ratios of firms in the largest asset-size quartile are smaller than those of firms in smaller asset-size quartiles, where the smallest asset-size quartile seemed to be more reliant on short-term debt in most recent years. Note that the differences in short-term debt ratios for the larger private firms are less distinct than those for the smaller private firms. The *Tables XVII* and *XVIII* show that the long-term leverage ratios of the larger private firms are comparable to those of publicly traded firms, with mean long-term debt ratios ranging between 0.08 and 0.13 during the period 1992-1999.[12] Firms in the largest asset-size quartile use the largest portion of long-term debt. Firms in lower asset-size quartiles finally appear to use slightly more long-term debt in comparison with smaller private firms.

11 Since these striking differences in long-term debt ratios between the largest and the smallest asset-size quartile exist throughout the whole period 1992-1999, they do not seem to be attributable only to the rise of the new technology firms.

12 This suggests that firms in the 50 and above employee range (whether private or public) have similar access to (long-term) bank financing. This implies that there may be a critical breakpoint around the 50 employee size that dictates the ease of access of firms to long-term finance. This is consistent with the view that smaller firms are more costly to monitor, and the risk-return tradeoff (for small-sized loans) tends to work against the provision of long-term finance to these firms.

2.4 Life Cycle Effects in the Capital Structures of Publicly Traded and Private Firms

In this section, we document how the capital structures of Dutch listed and non-listed firms change with the stage in their life cycles. In general, it can be expected that infant firms mainly rely on internal equity (equity financing by the entrepreneur) and possibly 'angel' financing and/or venture capital financing. As firms grow and start generating cash flows, they may gain access to bank financing and other sources of private debt (and equity) financing. The leverage ratios for maturing firms as a consequence could be expected to increase. As firms mature further, they potentially gain access to public debt and, particularly, equity markets (through IPOs and secondary issues). At this stage, their leverage ratios might be expected to decline again.[13] Of course, the smaller the equity market and/or the more costly it is to access this market, the less likely it is that (except for the very largest firms) leverage ratios will fall in later stages of a firm's life cycle (see Fluck, 1998).[14]

In order to analyze potential life cycle effects in firms' capital structures, we examine the differences in debt to total asset ratios as a function of firm maturity, measured by the number of years since incorporation (for both publicly traded and private firms) and by the number of years since listing (for publicly traded firms).[15] Analogous to previous studies, we group firms into three maturity classes relative to their date of listing or incorporation: (*i*) firms with a maturity less than or equal to 10 years, (*ii*) firms with a maturity between 10 and 30 years, and (*iii*) firms with a maturity larger than 30 years. Using this classification, we calculated the mean and median debt ratios of the firms in our sample for each of the years 1992-1999.[16]

Table XIX presents the leverage ratios of listed firms as a function of firm maturity since their date of incorporation (Panel A) and since their date of listing (Panel B). From Panel A it can be seen that firms with a maturity between 10 and 30 years since incorporation had the highest mean debt ratios during the period 1993-1999. Panel A also shows that, although the leverage ratios of firms with a maturity less than or equal to 10 years were significantly higher than those of firms with a maturity of more than 30 years during the period 1993-1994 (with a difference of 5-6%), this difference in lever-

13 Observe that our description of changes in firms' capital structure choices as a function of the stage in their lifecycle reflects theoretical predictions for a 'typical' firm that can be found in the modern corporate finance literature (see for example Harris and Raviv, 1991, Carey, Prowse, Rea and Udell, 1993 and Fluck, 1998) and only serves illustrative purposes. The evolution of a firm's capital structure over time, however, will depend on the type of the firm's activities, and thus its asset specificity. We therefore may find different financing patterns over time for different types of firms. For example, the new technology (and internet) firms that arose in the period 1995-1999 went public at a relatively early stage, and showed insignificant amounts of (bank) leverage due to the specificity of their assets and their inability to generate cash flows at a relatively early stage. A majority of these firms relied on venture capital financing and went public before generating significant (positive) cash flows.

14 Another mitigating factor in this respect could be the ability of larger firms to substitute less costly public debt for bank debt. In the Netherlands, this is only likely for the very largest and globally oriented firms (see also Boot, Ligterink and Schmeits, 1997).

15 Observe that ideally we would like to perform this analysis at the 'micro-level' of individual firms, by tracking a group of individual firms from birth (i.e., the date of incorporation) through their growth stage to their public listing and/or mature stage and, finally, their exit. The Reach database, however, does not include sufficiently complete and unambiguous information to do this. We therefore focus on a more aggregate analysis.

16 We used the same sample of publicly traded firms as before. For private firms, we omitted a very small number of firms for which the date of incorporation could not be found in the Reach database.

age ratios appears to switch after 1994, and newer firms have shown slightly lower or similar leverage ratios vis-à-vis more mature firms during the period 1995-1999. Panel B shows that the mean debt ratios of firms with the highest maturity since listing are fairly stable during the period 1993-1999, and are lower than those for less mature firms. The mean debt ratios of the youngest listed firms (i.e., firms with a maturity less than or equal to 10 years since the date of listing) have increased slightly over time and are larger than those of more mature firms.

Table XX presents the leverage life cycle of private firms with 10-50 employees (Panel A) respectively private firms with 50-100 employees (Panel B) relative to their date of incorporation. Both Panel A and Panel B show that the mean debt ratios of the youngest private firms are significantly higher than those of the most mature firms, with the differences ranging between 0.03 and 0.24 (for firms with 10-50 employees) respectively between 0.04 and 0.16 (for firms with 50-100 employees). In early stages of their life cycle, private firms appear to have limited sources of equity financing (owner's wealth, venture capital, retained earnings, etc.), and thus appear to rely heavily on external (bank) debt. However, since for these firms external debt is a more costly source of finance than internally generated equity (retained earnings, see Myers and Majluf, 1984), private firms gradually reduce their debt reliance as they mature. Firms that survive for more than 30 years (the most mature firms) are more likely to have been profitable over time and to have generated retained earnings as a substitute for debt financing relative to less mature firms. The youngest firms, therefore, should rely most on bank financing. Panel A also shows for the youngest of the smaller private firms both the mean debt ratios and the difference in leverage relative to the most mature firms have decreased substantially during the period 1995-1999. One potential explanation for this observation might be that during this period a larger proportion of newer companies consisted of technology firms, with less predictable assets and cash flows. As a consequence, newer firms may have come to rely relatively more on equity financing (through venture capital or IPOs) in comparison to the period before 1995, given banks' reluctance to provide debt financing to these firms.[17] This argument might also explain the lower debt ratios of the youngest listed firms during the period 1995-1999 reported in Panel A of *Table XIX*.[18] Finally, and perhaps most interestingly, the *Tables XIX* and *XX* show that the debt ratios of the most mature of the larger private firms (with 50-100 employees) are only slightly higher (and thus comparable to) those of publicly traded firms. By comparison, the leverage ratios of the youngest private firms for both cohorts of employee numbers appear to be substantially higher than those of listed firms with the same maturity.

17 This seems to be consistent with the increased supply of risk capital in the second half of the nineties (see Section 5).

18 Whether it does, depends on the proportion of new technology firms that was publicly traded during the period 1995-1999. A further examination of our sample indicates that the mean debt ratios of firms that went public less than ten years after incorporation were relatively lower than those of more mature firms that went public during this period. Since these younger firms tend to be mainly technology firms, this seems to support our argument.

2.5 The Funding Sources of Dutch Corporations: A Supply Perspective

In this section, we shift our perspective to the supply side of the financial sector in the Netherlands, and briefly discuss the role of banks, financial markets and other capital suppliers in the provision of financing to Dutch listed and non-listed firms. Taking a supply perspective is important, since the functioning of the financial sector in an economy has a direct impact on the availability and the cost of financing for firms (see Rajan and Zingales, 1995, and Boot and Thakor, 1998). In a well-functioning financial system, resources are efficiently allocated and can be transferred at a low cost. Frictions in the financial markets, on the other hand, may limit the access to financing for (specific types of) firms. We focus on the sources of debt financing for Dutch firms and on the sources of financing for smaller (private) firms. Our analysis complements the international comparison of the relative importance of different financing sources in the previous chapter, and is based on aggregate statistics obtained from the Dutch Central Bank, CBS (Central Bureau of Statistics) and the OECD.[19]

In the last decade, retained earnings were an important funding source for Dutch non-financial corporations (during the period 1991-1995 retained earnings accounted for 50-80% of the total financing needs of Dutch firms). During the period 1991-1995 equity issues were important as well (covering between 15-25% of firms' total funding needs), whereas the importance of bond issues was almost negligible (covering less than 2.5% of firms' total funding needs).[20]

The most important external suppliers of financing in the Netherlands are institutional investors (pension funds and insurance companies) and commercial banks. During the last decade, these accounted for over 80% of the annual net supply of funding (debt and equity). Both institutional investors and banks mainly participated in domestic bond financing, bank loans and private placements. The provision of risk capital was predominantly in the hands of venture capital firms, which in 1995 supplied close to 90% of the total amount of risk capital in the Dutch economy (see Boot and Schmeits, 1996).

As described in the previous chapter, the Dutch bond market plays only a very minor role in the provision of debt to non-financial corporations. This market is characterized by a low liquidity ('thin' trade, except for the segment of government bonds) and a low

17 This seems to be consistent with the increased supply of risk capital in the second half of the nineties (see Section 2.5).

18 Whether it does, depends on the proportion of new technology firms that was publicly traded during the period 1995-1999. A further examination of our sample indicates that the mean debt ratios of firms that went public less than ten years after incorporation were relatively lower than those of more mature firms that went public during this period. Since these younger firms tend to be mainly technology firms, this seems to support our argument.

19 Although ideally we would like to examine a breakdown of the financing sources for the firms in our Reach sample, the lack of data availability at the individual firm level does not allow for this type of exercise (see also footnote 5). The OECD statistics include all firms with a book value of total assets larger than or equal to $5 million. The CBS statistics include all Dutch listed firms. Observe that in these statistics the smaller private firms are underrepresented. Since these firms have more limited access to the Dutch bond and equity markets, their reliance on bank and private debt and equity financing is larger than indicated in the statistics. A more elaborate description of the OECD and CBS statistics, as well as the institutional details of the Dutch financial sector, can be found in Boot and Schmeits (1996), Boot, Ligterink and Schmeits (1997), and Ligterink and Schmeits (1998). In this section, we draw mainly on the findings in these studies.

20 During this period, however, only relatively large firms were able to place new equity issues in the market. As a financing source for smaller firms, therefore, the equity market was relatively unimportant.

number of corporate bonds outstanding, although the number of corporate bonds issued has increased recently (see Chapter 1). As is the case in Germany, bonds are predominantly issued by the Dutch government and by domestic and foreign financial intermediaries. Corporate bonds have almost exclusively been issued by relatively large (and lower risk) 'internationals' and industrial firms. This suggests the potential existence of entry barriers for smaller, and more risky firms (see Boot, Ligterink and Schmeits, 1997).[21] Some of the very large Dutch corporations are active players in the Eurobond market, which has become increasingly important in the last decade (Eurobonds represented over 35% of the total issue amount in corporate bonds in 1995).

The main external debt sources for non-financial listed Dutch companies are bank financing and placements of private debt. In 1995, these funding sources accounted for most of the debt financing of listed non-financial firms (with the proportion of bank financing varying around 15-20%).[22] In contrast, bond financing accounted for less than 10% in this year, whereas accounts payable (trade credits) and other debt sources (subordinated loans and repayment provisions) accounted for 30% (see Boot, Ligterink and Schmeits, 1997).[23] Although the private debt market in the Netherlands is very well developed, reliable information on this market is scarce.[24] During the period 1991-1995, Dutch non-financial firms obtained Dfl. 15 billion ($7.5 billion) through private debt financing (in comparison, the nominal amount of corporate bond issues equaled Dfl. 9.35 billion ($4.675 billion), see also De Haan and Hinloopen, 1999). The private debt market therefore is a more important source of financing for Dutch non-financial corporations than the corporate bond market.

As indicated above, smaller firms in the Netherlands primarily rely on private debt and equity financing, and appear to have limited access to the Dutch bond and stock market. For their debt financing, these firms mainly depend on bank loans and trade credit. Until the beginning of the nineties, the supply of risk capital to small, new and information-problematic firms was relatively restricted. Partly due to successful government intervention aimed at mitigating frictions in the financing of small firms, the allocation of risk capital to such firms by venture capital funds (and venture capital subsidiaries of banks) has substantially increased since then.[25]

21 This is partly due to the lack of a broad network of bond analysts and active underwriters in the Netherlands, and thus the lack of information production on smaller firms with more information-sensitive assets.

22 According to the CBS Statistics, in 1995, bank financing and other non-working capital related debt (including other private debt and leases) accounted for more than 60% of total debt financing of non-financial listed firms.

23 In a recent paper, De Haan and Hinloopen (1999) report that for a sample of 153 non-financial listed Dutch companies between 1984 and 1997 58% of the financing needs were satisfied through internal financing (retained equity), 10% through equity issues, 6% through bond issues and 26% via private debt transactions.

24 The private debt market (or 'over-the-counter' (OTC) market) differs from the public debt market on at least three dimensions (see De Haan, 1995): (1) transactions in this market are not subject to strict disclosure rules and exchange regulations; (2) information on the contract terms of loans in this market is not public; (3) parties on both sides of the market directly negotiate the terms of the loans. Since private debt financing generally is concentrated with a small amount of capital suppliers, and therefore easily renegotiable, private debt financing can be attractive in the case of the existence of information asymmetry between firms and capital suppliers.

25 For example, the 'Borgstellingsregeling Midden- en Kleinbedrijf' (BMKB), see also Chapter 4. A comprehensive overview of the measures of government intervention in the Dutch capital market can be found in Boot and Schmeits (1996).

2.6 Summary and Conclusions

In this chapter, we have documented the financing behavior in the past decade of both private and publicly traded non-financial firms in the Netherlands, taking both a demand and a supply perspective. We used standardized financial statement information from firms in the Reach database to: (*i*) compare overall leverage ratios of listed and unlisted Dutch firms; (*ii*) examine how these leverage ratios (including their breakdown in short-term and long-term components) vary with firm size; (*iii*) examine how the leverage ratios of publicly traded private firms depend on the stage in their life cycle.

Most of our findings are not surprising. Specifically, those firms with access to the Dutch equity market (listed firms) have significantly lower debt ratios than unlisted firms (irrespective of their size). This suggests that, even though equity financing 'on average' is more costly than 'debt financing (i.e., taking into account tax effects, agency costs, bankruptcy costs, etc.), and the Dutch equity market is not large (by international standards), larger firms find access to such markets useful and appear to utilize them.[26] We also found that larger private firms (unlisted firms with 50-100 employees) had substantially lower debt ratios than smaller private firms (unlisted firms with 10-50 employees).

Our breakdowns in asset-size quartiles (based on the book value of total assets) indicate that, on average, leverage ratios are the highest for the smallest asset-size quartile of the smaller private firms, and that there may be a structural shift in leverage as firms grow beyond the smallest asset-size quartile.

For all firms, large and small, the maturity structure of debt is dominated by short-term debt (short-term debt comprises on average more than 75% of the total use of debt). For both publicly traded and private firms, long-term debt is predominantly used by the two largest asset-size quartiles. Of particular interest is that, during the whole sample period (1992-1999), the smallest asset-size quartile of the smaller private firms used very small (almost negligible) amounts of long-term debt. This could be an issue of concern, since it may point at a limited access to (longer-term) bank financing for these firms.

With respect to life cycle effects, one interesting result is the decreasing reliance of young private firms (i.e., private firms with a maturity less than or equal to 10 years since incorporation) and young listed firms (i.e., listed firms with a maturity less than or equal to 10 years since incorporation) on debt vis-à-vis the most mature listed firms. One possible reason for this is that these younger firms may reflect the structural shift in the economy towards new technology firms. As a result, younger firms today are likely to have less predictable cash flows and asset values relative to those in the not too distant past. This may result in a greater reluctance of banks to lend to these firms. As a consequence, these firms appear to exhibit a greater reliance on IPOs, venture capital and other forms of equity finance (which since 1995 have become increasingly available).

Finally, we found that while younger private firms had substantially higher debt ratios than equivalently mature listed firms, the debt ratios of the most mature private compa-

26 Recent research by Baker and Wurgler (2000) suggests that the relative availability and costs of the two sources of finance change over the business cycle, and that firms time their equity expansions when this relative cost is lowest.

nies (i.e., private firms with a maturity larger than 30 years) and those of publicly traded companies with the same maturity are very similar. This suggests that for the most long-lived firms listing on a public equity market is not a prerequisite to achieve their desired, or target, capital structures. The capital structure choices for these larger private firms may therefore reflect owner choice rather than the existence of institutional and/or size barriers to entry.

Table I: Extent of Leverage in Netherlands – Debt to Total Assets Ratios of Listed Firms

Debt to Total Assets ratios are calculated for all non-financial listed companies reporting consolidated balance sheets in any year during the period 1993-1999. Both debt and equity are measured at book value. Firms for which shareholder's equity is negative are excluded. Debt to total assets is defined as the book value of short-term plus long-term debt divided by the book value of total assets. Short-term debt includes debt in current liabilities, long-term debt due in one year, and short-term borrowings (accounts payable and other current liabilities).

Debt to Total Assets of Publicly Listed Firms

	1993			1994			1995			1996		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	101	0.51	0.53	108	0.51	0.52	112	0.52	0.55	117	0.53	0.55
Top 25% by total assets	25	0.50	0.56	27	0.48	0.53	28	0.49	0.52	29	0.52	0.55
Second 25% by total assets	25	0.56	0.57	27	0.56	0.58	28	0.54	0.55	29	0.55	0.58
Third 25% by total assets	25	0.47	0.48	27	0.48	0.48	28	0.49	0.53	29	0.53	0.55
Bottom 25% by total assets	26	0.50	0.50	27	0.52	0.52	28	0.57	0.60	30	0.53	0.52

	1997			1998			1999		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	125	0.53	0.54	135	0.55	0.57	139	0.56	0.59
Top 25% by total assets	31	0.52	0.55	34	0.54	0.58	35	0.58	0.65
Second 25% by total assets	31	0.56	0.59	34	0.58	0.57	35	0.58	0.59
Third 25% by total assets	31	0.53	0.55	34	0.56	0.57	35	0.56	0.59
Bottom 25% by total assets	32	0.51	0.53	33	0.53	0.52	34	0.52	0.50

Source: Reach Database

Table II: Extent of Leverage in Netherlands – Debt to Capital Ratios of Listed Firms

Debt to Capital ratios are calculated for all non-financial listed companies reporting consolidated balance sheets in any year during the period 1993-1999. Both debt and equity are measured at book value. Firms for which shareholder's equity is negative are excluded. Debt to capital is defined as the book value of debt divided by the sum of the book value of debt and equity. The book value of debt is the sum of short-term and long-term debt. Short-term debt includes debt in current liabilities, long-term debt due in one year, and short-term borrowings (accounts payable and other current liabilities).

Debt to Capital of Publicly Listed Firms

	1993			1994			1995			1996		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	101	0.55	0.57	108	0.55	0.57	112	0.56	0.59	117	0.57	0.61
Top 25% by total assets	25	0.55	0.62	27	0.53	0.62	28	0.54	0.59	29	0.57	0.61
Second 25% by total assets	25	0.62	0.64	27	0.62	0.66	28	0.59	0.61	29	0.60	0.64
Third 25% by total assets	25	0.50	0.54	27	0.51	0.52	28	0.53	0.56	29	0.57	0.57
Bottom 25% by total assets	26	0.54	0.52	27	0.55	0.55	28	0.60	0.63	30	0.55	0.54

	1997			1998			1999		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	125	0.57	0.58	135	0.59	0.60	139	0.59	0.63
Top 25% by total assets	31	0.56	0.57	34	0.60	0.65	35	0.63	0.70
Second 25% by total assets	31	0.61	0.65	34	0.62	0.64	35	0.62	0.63
Third 25% by total assets	31	0.57	0.59	34	0.60	0.61	35	0.59	0.62
Bottom 25% by total assets	32	0.53	0.56	33	0.55	0.55	34	0.54	0.53

Source: Reach Database

Table III: Extent of Leverage in Netherlands – Short-Term Debt to Total Assets Ratios of Listed Firms

Short-Term Debt to Total Assets ratios are calculated for all non-financial listed companies reporting consolidated balance sheets in any year during the period 1993-1999. Both debt and equity are measured at book value. Firms for which shareholder's equity is negative are excluded. Short-term debt to total assets is defined as the book value of short-term debt divided by the book value of total assets. The book value of short-term debt is the sum of debt in current liabilities, long-term debt due in one year, and short-term borrowings (accounts payable and other liabilities).

Short-Term Debt to Total Assets of Publicly Listed Firms

	1993			1994			1995			1996		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	101	0.40	0.40	108	0.40	0.38	112	0.41	0.39	117	0.41	0.41
Top 25% by total assets	25	0.36	0.36	27	0.35	0.36	28	0.35	0.34	29	0.37	0.35
Second 25% by total assets	25	0.43	0.43	27	0.43	0.44	28	0.43	0.41	29	0.43	0.44
Third 25% by total assets	25	0.38	0.34	27	0.38	0.35	28	0.40	0.39	29	0.43	0.42
Bottom 25% by total assets	26	0.41	0.40	27	0.43	0.41	28	0.47	0.43	30	0.43	0.40

	1997			1998			1999		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	125	0.42	0.41	135	0.43	0.42	139	0.44	0.44
Top 25% by total assets	31	0.38	0.36	34	0.36	0.32	35	0.37	0.37
Second 25% by total assets	31	0.45	0.43	34	0.45	0.45	35	0.45	0.45
Third 25% by total assets	31	0.43	0.43	34	0.46	0.46	35	0.47	0.47
Bottom 25% by total assets	32	0.43	0.41	33	0.45	0.43	34	0.46	0.46

Source: Reach Database

Table IV: Extent of Leverage in Netherlands – Short-Term Debt to Capital Ratios of Listed Firms

Short-Term Debt to Capital Ratios are calculated for all non-financial listed companies reporting consolidated balance sheets in any year during the period 1993-1999. Both debt and equity are measured at book value. Firms for which shareholder's equity is negative are excluded. Short-term debt to capital is defined as the book value of short-term debt divided by the sum of the book value of debt and equity. The book value of short-term debt is the sum of debt in current liabilities, long-term debt due in one year, and short-term borrowings (accounts payable and other current liabilities).

	1993			1994			1995			1996		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	101	0.43	0.43	108	0.43	0.43	112	0.44	0.44	117	0.45	0.44
Top 25% by total assets	25	0.40	0.40	27	0.38	0.39	28	0.38	0.39	29	0.40	0.41
Second 25% by total assets	25	0.47	0.48	27	0.48	0.47	28	0.47	0.47	29	0.47	0.47
Third 25% by total assets	25	0.41	0.36	27	0.41	0.39	28	0.43	0.44	29	0.46	0.45
Bottom 25% by total assets	26	0.44	0.44	27	0.45	0.43	28	0.49	0.46	30	0.45	0.42

	1997			1998			1999		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	125	0.45	0.44	135	0.46	0.45	139	0.47	0.46
Top 25% by total assets	31	0.41	0.42	34	0.40	0.36	35	0.40	0.41
Second 25% by total assets	31	0.48	0.46	34	0.48	0.47	35	0.49	0.47
Third 25% by total assets	31	0.46	0.48	34	0.49	0.47	35	0.50	0.50
Bottom 25% by total assets	32	0.45	0.43	33	0.47	0.46	34	0.48	0.48

Source: Reach Database

Table V: Extent of Leverage in Netherlands – Long-Term Debt to Total Assets Ratios of Listed Firms

Long-Term Debt to Total Assets ratios are calculated for all non-financial listed companies reporting consolidated balance sheets in any year during the period 1993-1999. Both debt and equity are measured at book value. Firms for which shareholder's equity is negative are excluded. Long-term debt to total assets is defined as the book value of long-term debt divided by the book value of total assets.

Long-Term Debt to Total Assets of Publicly Listed Firms

	1993			1994			1995			1996		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	101	0.11	0.09	108	0.11	0.09	112	0.11	0.08	117	0.12	0.10
Top 25% by total assets	25	0.14	0.10	27	0.13	0.12	28	0.14	0.12	29	0.15	0.12
Second 25% by total assets	25	0.13	0.13	27	0.13	0.13	28	0.11	0.04	29	0.12	0.10
Third 25% by total assets	25	0.09	0.05	27	0.10	0.07	28	0.09	0.07	29	0.10	0.08
Bottom 25% by total assets	26	0.09	0.06	27	0.09	0.06	28	0.10	0.05	30	0.10	0.05

	1997			1998			1999		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	125	0.11	0.09	135	0.13	0.10	139	0.12	0.08
Top 25% by total assets	31	0.14	0.11	34	0.18	0.13	35	0.21	0.18
Second 25% by total assets	31	0.11	0.08	34	0.13	0.12	35	0.12	0.10
Third 25% by total assets	31	0.10	0.10	34	0.11	0.09	35	0.08	0.06
Bottom 25% by total assets	32	0.08	0.03	33	0.08	0.04	34	0.06	0.00

Source: Reach Database

Table VI: Extent of Leverage in Netherlands – Long-Term Debt to Capital Ratios of Listed Firms

Long-Term Debt to Capital ratios are calculated for all non-financial listed companies reporting consolidated balance sheets in any year during the period 1993-1999. Both debt and equity are measured at book value. Firms for which shareholder's equity is negative are excluded. Long-term debt to capital is defined as the book value of long-term debt divided by the sum of the book value of debt and equity.

Long-Term Debt to Capital of Publicly Listed Firms

	1993			1994			1995			1996		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	101	0.12	0.09	108	0.12	0.10	112	0.12	0.08	117	0.13	0.11
Top 25% by total assets	25	0.15	0.13	27	0.14	0.14	28	0.16	0.14	29	0.16	0.14
Second 25% by total assets	25	0.15	0.14	27	0.14	0.14	28	0.12	0.04	29	0.13	0.11
Third 25% by total assets	25	0.10	0.05	27	0.10	0.07	28	0.10	0.07	29	0.11	0.08
Bottom 25% by total assets	26	0.09	0.06	27	0.09	0.06	28	0.10	0.05	30	0.10	0.05

	1997			1998			1999		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	125	0.11	0.10	135	0.14	0.11	139	0.13	0.09
Top 25% by total assets	31	0.15	0.13	34	0.20	0.13	35	0.23	0.19
Second 25% by total assets	31	0.12	0.08	34	0.14	0.13	35	0.13	0.10
Third 25% by total assets	31	0.10	0.11	34	0.11	0.09	35	0.09	0.06
Bottom 25% by total assets	32	0.08	0.03	33	0.09	0.04	34	0.06	0.00

Source: Reach Database

Table VII: Extent of Leverage in Netherlands – Debt to Total Assets Ratios of Private Firms (10-50 Employees)

Debt to Total Assets ratios are calculated for all non-financial private companies (with 10-50 employees) reporting consolidated balance sheets in any year during the period 1992-1999. Both debt and equity are measured at book value. Firms for which shareholder's equity is negative are excluded. Debt to total assets is defined as the book value of short-term plus long-term debt divided by the book value of total assets. Short-term debt includes debt in current liabilities, long-term debt due in one year, and short-term borrowings (accounts payable and other current liabilities).

Debt to Total Assets of Private Firms with 10-50 Employees

	1992			1993			1994			1995		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	36	0.77	0.84	61	0.70	0.77	74	0.71	0.74	88	0.68	0.73
Top 25% by total assets	9	0.78	0.87	15	0.58	0.64	19	0.65	0.68	22	0.63	0.72
Second 25% by total assets	9	0.72	0.79	15	0.71	0.77	19	0.70	0.77	22	0.67	0.76
Third 25% by total assets	9	0.71	0.69	15	0.73	0.79	18	0.73	0.72	22	0.70	0.71
Bottom 25% by total assets	9	0.88	0.91	16	0.78	0.81	18	0.75	0.79	22	0.73	0.73
	1996			1997			1998			1999		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	103	0.69	0.74	134	0.65	0.70	137	0.64	0.71	85	0.67	0.71
Top 25% by total assets	26	0.62	0.61	34	0.54	0.54	34	0.55	0.51	21	0.57	0.65
Second 25% by total assets	26	0.74	0.77	34	0.73	0.78	34	0.71	0.75	21	0.72	0.79
Third 25% by total assets	26	0.70	0.77	33	0.64	0.69	34	0.67	0.70	21	0.72	0.73
Bottom 25% by total assets	25	0.69	0.65	33	0.67	0.68	35	0.63	0.69	22	0.68	0.69

Source: Reach Database

Table VIII: Extent of Leverage in Netherlands – Debt to Total Capital Ratios of Private Firms (10-50 Employees)

Debt to Capital ratios are calculated for all non-financial private companies (with 10-50 employees) reporting consolidated balance sheets in any year during the period 1992-1999. Both equity and debt are measured at book value. Firms for which shareholder's equity is negative are excluded. Debt to capital is defined as the book value of debt divided by the sum of the book value of debt and equity. The book value of debt is the sum of short-term and long-term debt. Short-term debt includes debt in current liabilities, long-term debt due in one year, and short-term borrowings (accounts payable and other current liabilities).

Debt to Capital of Private Firms with 10-50 Employees

	1992			1993			1994			1995		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	36	0.80	0.86	61	0.73	0.78	74	0.73	0.76	88	0.71	0.76
Top 25% by total assets	9	0.80	0.89	15	0.61	0.69	19	0.68	0.73	22	0.67	0.74
Second 25% by total assets	9	0.76	0.84	15	0.75	0.79	19	0.74	0.79	22	0.71	0.80
Third 25% by total assets	9	0.74	0.71	15	0.75	0.79	18	0.74	0.73	22	0.72	0.74
Bottom 25% by total assets	9	0.90	0.91	16	0.81	0.81	18	0.79	0.79	22	0.75	0.75

	1996			1997			1998			1999		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	103	0.71	0.76	134	0.68	0.74	137	0.67	0.73	85	0.70	0.74
Top 25% by total assets	26	0.64	0.72	34	0.59	0.68	34	0.59	0.59	21	0.62	0.74
Second 25% by total assets	26	0.78	0.81	34	0.76	0.82	34	0.74	0.80	21	0.75	0.85
Third 25% by total assets	26	0.71	0.78	33	0.69	0.74	34	0.69	0.72	21	0.74	0.76
Bottom 25% by total assets	25	0.71	0.66	33	0.69	0.70	35	0.65	0.72	22	0.71	0.72

Source: Reach Database

Table IX: Extent of Leverage in Netherlands – Short-Term Debt to Total Assets Ratios of Private Firms (10-50 Employees)

Short-Term Debt to Total Assets ratios are calculated for all non-financial private companies (with 10-50 employees) reporting consolidated balance sheets in any year during the period 1992-1999. Both debt and equity are measured at book value. Firms for which shareholder's equity is negative are excluded. Short-term debt to total assets is defined as the book value of short-term debt divided by total assets. The book value of short-term debt is the sum of debt in current liabilities, long-term debt due in one year, and short-term borrowings (accounts payable and other current liabilities).

Short-Term Debt to Total Assets of Private Firms with 10-50 Employees

	1992			1993			1994			1995		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	36	0.57	0.61	61	0.53	0.60	74	0.56	0.60	88	0.56	0.61
Top 25% by total assets	9	0.41	0.43	15	0.22	0.15	19	0.32	0.27	22	0.38	0.35
Second 25% by total assets	9	0.47	0.48	15	0.55	0.62	19	0.53	0.60	22	0.55	0.58
Third 25% by total assets	9	0.56	0.60	15	0.61	0.53	18	0.67	0.67	22	0.64	0.70
Bottom 25% by total assets	9	0.84	0.87	16	0.74	0.73	18	0.73	0.73	22	0.68	0.68

	1996			1997			1998			1999		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	103	0.57	0.59	134	0.54	0.58	137	0.52	0.53	83	0.55	0.60
Top 25% by total assets	26	0.39	0.26	34	0.37	0.15	34	0.38	0.18	21	0.29	0.15
Second 25% by total assets	26	0.64	0.70	34	0.58	0.60	34	0.52	0.51	21	0.57	0.61
Third 25% by total assets	26	0.59	0.59	33	0.56	0.56	34	0.58	0.56	21	0.68	0.71
Bottom 25% by total assets	25	0.67	0.64	33	0.64	0.65	35	0.59	0.62	22	0.65	0.65

Source: Reach Database

Table X: Extent of Leverage in Netherlands – Short-Term Debt to Capital Ratios of Private Firms (10-50 Employees)

Short-Term Debt to Capital ratios are calculated for all non-financial private companies (with 10-50 employees) reporting consolidated balance sheets in any year during the period 1992-1999. Both debt and equity are measured at book value. Firms for which shareholder's equity is negative are excluded. Short-term debt to capital is defined as the book value of short-term debt divided by the sum of the book value of debt and equity. The book value of short-term debt is the sum of debt in current liabilities, long-term debt due in one year, and short-term borrowings (accounts payable and other current liabilities).

Short-Term Debt to Capital of Private Firms with 10-50 Employees

	1992			1993			1994			1995		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	36	0.59	0.64	61	0.55	0.62	74	0.58	0.64	88	0.59	0.64
Top 25% by total assets	9	0.42	0.43	15	0.23	0.15	19	0.34	0.27	22	0.40	0.38
Second 25% by total assets	9	0.49	0.51	15	0.57	0.67	19	0.56	0.60	22	0.58	0.63
Third 25% by total assets	9	0.59	0.62	15	0.63	0.58	18	0.68	0.70	22	0.66	0.71
Bottom 25% by total assets	9	0.86	0.88	16	0.77	0.74	18	0.76	0.74	22	0.70	0.68

	1996			1997			1998			1999		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	103	0.59	0.61	134	0.57	0.61	137	0.54	0.56	85	0.57	0.62
Top 25% by total assets	26	0.41	0.26	34	0.40	0.20	34	0.41	0.21	21	0.31	0.17
Second 25% by total assets	26	0.67	0.72	34	0.60	0.60	34	0.54	0.56	21	0.59	0.65
Third 25% by total assets	26	0.60	0.60	33	0.61	0.64	34	0.59	0.61	21	0.70	0.71
Bottom 25% by total assets	25	0.69	0.65	33	0.67	0.68	35	0.61	0.64	22	0.67	0.67

Source: Reach Database

Table XI: Extent of Leverage in Netherlands – Long-Term Debt to Total Assets Ratios of Private Firms (10-50 Employees)

Long-Term Debt to Total Assets ratios are calculated for all non-financial private companies (with 10-50 employees) reporting consolidated balance sheets in any year during the period 1992-1999. Both debt and equity are measured at book value. Firms for which shareholder's equity is negative are excluded. Long-term debt to total assets is defined as the book value of long-term debt divided by the book value of total assets.

Long-Term Debt to Total Assets of Private Firms with 10-50 Employees

	1992			1993			1994			1995		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	36	0.20	0.12	61	0.17	0.06	74	0.15	0.03	88	0.12	0.03
Top 25% by total assets	9	0.37	0.33	15	0.36	0.34	19	0.32	0.29	22	0.24	0.22
Second 25% by total assets	9	0.26	0.22	15	0.16	0.02	19	0.17	0.09	22	0.12	0.00
Third 25% by total assets	9	0.14	0.01	15	0.11	0.00	18	0.05	0.00	22	0.06	0.00
Bottom 25% by total assets	9	0.04	0.01	16	0.04	0.02	18	0.02	0.00	22	0.05	0.03

	1996			1997			1998			1999		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	103	0.12	0.00	134	0.11	0.01	137	0.12	0.00	85	0.13	0.00
Top 25% by total assets	26	0.22	0.15	34	0.17	0.08	34	0.17	0.07	21	0.28	0.30
Second 25% by total assets	26	0.11	0.00	34	0.15	0.02	34	0.19	0.05	21	0.15	0.05
Third 25% by total assets	26	0.11	0.00	33	0.08	0.00	34	0.09	0.00	21	0.04	0.00
Bottom 25% by total assets	25	0.02	0.00	33	0.03	0.00	35	0.04	0.00	22	0.03	0.00

Source: Reach Database

Table XII: Extent of Leverage in Netherlands – Long-Term Debt to Capital Ratios of Private Firms (10-50 Employees)

Long-Term Debt to Capital ratios are calculated for all non-financial private companies (with 10-50 employees) reporting consolidated balance sheets in any year during the period 1992-1999. Both debt and equity are measured at book value. Firms for which shareholder's equity is negative are excluded. Long-term debt to capital is defined as the book value of long-term debt divided by the sum of the book value of debt and equity.

Long-Term Debt to Capital of Private Firms with 10-50 Employees

	1992			1993			1994			1995		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	36	0.21	0.12	61	0.18	0.06	74	0.15	0.03	88	0.13	0.03
Top 25% by total assets	9	0.38	0.33	15	0.38	0.35	19	0.34	0.33	22	0.27	0.22
Second 25% by total assets	9	0.27	0.22	15	0.17	0.02	19	0.18	0.09	22	0.13	0.00
Third 25% by total assets	9	0.15	0.01	15	0.12	0.00	18	0.06	0.00	22	0.06	0.00
Bottom 25% by total assets	9	0.04	0.01	16	0.04	0.02	18	0.02	0.00	22	0.05	0.03

	1996			1997			1998			1999		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	103	0.12	0.00	134	0.12	0.01	137	0.13	0.00	85	0.13	0.00
Top 25% by total assets	26	0.24	0.16	34	0.18	0.08	34	0.18	0.07	21	0.30	0.30
Second 25% by total assets	26	0.11	0.00	34	0.16	0.02	34	0.20	0.05	21	0.16	0.05
Third 25% by total assets	26	0.11	0.00	33	0.09	0.00	34	0.09	0.00	21	0.04	0.00
Bottom 25% by total assets	25	0.02	0.00	33	0.03	0.00	35	0.04	0.00	22	0.03	0.00

Source: Reach Database

Table XIII: Extent of Leverage in Netherlands – Debt to Total Assets Ratios of Private Firms (50-100 Employees)

Debt to Total Assets ratios are calculated for all non-financial private companies (with 50-100 employees) reporting consolidated balance sheets in any year during the period 1992-1999. Both debt and equity are measured at book value. Firms for which shareholder's equity is negative are excluded. Debt to total assets is defined as the book value of short-term plus long-term debt divided by the book value of total assets. Short-term debt includes debt in current liabilities, long-term debt due in one year, and short-term borrowings (accounts payable and other current liabailities).

Debt to Total Assets of Private Firms with 50-100 Employees

	1992			1993			1994			1995		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	55	0.59	0.62	104	0.58	0.59	120	0.60	0.63	132	0.62	0.64
Top 25% by total assets	14	0.58	0.60	26	0.54	0.58	30	0.63	0.70	33	0.66	0.71
Second 25% by total assets	14	0.57	0.58	26	0.57	0.62	30	0.59	0.65	33	0.63	0.69
Third 25% by total assets	14	0.62	0.60	26	0.65	0.64	30	0.61	0.60	33	0.62	0.62
Bottom 25% by total assets	13	0.59	0.63	26	0.56	0.54	30	0.59	0.63	33	0.55	0.58

	1996			1997			1998			1999		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	160	0.60	0.62	189	0.60	0.63	202	0.59	0.63	106	0.61	0.66
Top 25% by total assets	40	0.55	0.63	47	0.63	0.72	51	0.63	0.70	27	0.62	0.83
Second 25% by total assets	40	0.65	0.70	47	0.62	0.67	51	0.55	0.57	27	0.58	0.64
Third 25% by total assets	40	0.62	0.59	47	0.61	0.58	50	0.61	0.66	26	0.63	0.63
Bottom 25% by total assets	40	0.58	0.61	48	0.55	0.58	50	0.59	0.60	26	0.61	0.65

Source: Reach Database

Table XIV: Extent of Leverage in Netherlands – Debt to Capital Ratios of Private Firms (50-100 Employees)

Debt to Capital ratios are calculated for all non-financial private companies (with 50-100 employees) reporting consolidated balance sheets in any year during the period 1992-1999. Both debt and equity are measured at book value. Firms for which shareholder's equity is negative are excluded. Debt to capital is defined as the book value of debt divided by the sum of the book value of debt and equity. The book value of debt is the sum of short-term and long-term debt. Short-term debt includes debt in current liabilities, long-term debt due in one year, and short-term borrowings (accounts payable and other current liabilities).

Debt to Capital of Private Firms with 50-100 Employees

	1992			1993			1994			1995		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	55	0.62	0.67	104	0.61	0.65	120	0.63	0.67	132	0.65	0.68
Top 25% by total assets	14	0.62	0.69	26	0.58	0.64	30	0.66	0.72	33	0.69	0.73
Second 25% by total assets	14	0.60	0.68	26	0.60	0.69	30	0.62	0.68	33	0.68	0.78
Third 25% by total assets	14	0.65	0.61	26	0.68	0.69	30	0.64	0.65	33	0.66	0.66
Bottom 25% by total assets	13	0.62	0.68	26	0.60	0.58	30	0.61	0.68	33	0.58	0.62

	1996			1997			1998			1999		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	160	0.63	0.67	189	0.64	0.67	202	0.63	0.67	106	0.65	0.70
Top 25% by total assets	40	0.61	0.69	47	0.69	0.79	51	0.69	0.81	27	0.69	0.86
Second 25% by total assets	40	0.68	0.73	47	0.65	0.68	51	0.58	0.60	27	0.60	0.65
Third 25% by total assets	40	0.65	0.63	47	0.64	0.64	50	0.63	0.67	26	0.66	0.69
Bottom 25% by total assets	40	0.61	0.66	48	0.57	0.59	50	0.60	0.63	26	0.62	0.68

Source: Reach Database

Table XV: Extent of Leverage in Netherlands – Short-Term Debt to Total Assets Ratios of Private Firms (50-100 Employees)

Short-Term Debt to Total Assets ratios are calculated for all non-financial private companies (with 50-100 employees) reporting consolidated balance sheets in any year during the period 1992-1999. Both debt and equity are measured at book value. Firms for which shareholder's equity is negative are excluded. Short-term debt to total assets is defined as the book value of short-term debt divided by total assets. The book value of short-term debt is the sum of debt in current liabilities, long-term debt due in one year, and short-term borrowings (accounts payable and other current liabilities).

Short-Term Debt to Total Assets of Private Firms with 50-100 Employees

	1992			1993			1994			1995		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	55	0.51	0.53	104	0.48	0.45	120	0.50	0.48	132	0.51	0.49
Top 25% by total assets	14	0.45	0.50	26	0.40	0.30	30	0.45	0.42	33	0.44	0.41
Second 25% by total assets	14	0.51	0.51	26	0.50	0.52	30	0.53	0.56	33	0.56	0.65
Third 25% by total assets	14	0.55	0.53	26	0.53	0.46	30	0.53	0.48	33	0.55	0.54
Bottom 25% by total assets	13	0.52	0.55	26	0.49	0.46	30	0.51	0.48	33	0.50	0.41
	1996			1997			1998			1999		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	160	0.49	0.51	189	0.50	0.48	202	0.48	0.47	106	0.49	0.46
Top 25% by total assets	40	0.38	0.33	47	0.44	0.45	51	0.44	0.39	27	0.42	0.33
Second 25% by total assets	40	0.54	0.60	47	0.54	0.55	51	0.48	0.42	27	0.51	0.45
Third 25% by total assets	40	0.54	0.51	47	0.53	0.49	50	0.50	0.50	26	0.47	0.46
Bottom 25% by total assets	40	0.52	0.52	48	0.48	0.46	50	0.51	0.51	26	0.56	0.55

Source: Reach Database

Table XVI: Extent of Leverage in Netherlands – Short-Term Debt to Capital Ratios of Private Firms (50-100 Employees)

Short-Term Debt to Capital ratios are calculated for all non-financial private companies (with 50-100 employees) reporting consolidated balance sheets in any year during the period 1992-1999. Both debt and equity are measured at book value. Firms for which shareholder's equity is negative are excluded. Short-term debt to capital is defined as the book value of short-term debt divided by the sum of the book value of debt and equity. The book value of short-term debt is the sum of debt in current liabilities, long-term debt due in one year, and short-term borrowings (accounts payable and other current liabilities).

Short-Term Debt to Capital of Private Firms with 50-100 Employees

	1992			1993			1994			1995		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	55	0.54	0.55	104	0.51	0.47	120	0.53	0.50	132	0.54	0.54
Top 25% by total assets	14	0.48	0.54	26	0.42	0.33	30	0.47	0.44	33	0.46	0.41
Second 25% by total assets	14	0.54	0.55	26	0.53	0.54	30	0.56	0.58	33	0.60	0.69
Third 25% by total assets	14	0.58	0.55	26	0.56	0.48	30	0.55	0.51	33	0.58	0.56
Bottom 25% by total assets	13	0.54	0.62	26	0.52	0.47	30	0.54	0.49	33	0.52	0.43

	1996			1997			1998			1999		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	160	0.52	0.54	189	0.53	0.51	202	0.51	0.51	106	0.52	0.49
Top 25% by total assets	40	0.42	0.38	47	0.49	0.48	51	0.48	0.45	27	0.48	0.39
Second 25% by total assets	40	0.56	0.62	47	0.56	0.56	51	0.50	0.48	27	0.53	0.48
Third 25% by total assets	40	0.56	0.54	47	0.56	0.52	50	0.53	0.54	26	0.49	0.48
Bottom 25% by total assets	40	0.55	0.53	48	0.49	0.49	50	0.52	0.52	26	0.57	0.57

Source: Reach Database

Table XVII: Extent of Leverage in Netherlands – Long-Term Debt to Total Assets Ratios of Private Firms (50-100 Employees)

Long-Term Debt to Total Assets ratios are calculated for all non-financial private companies (with 50-100 employees) reporting consolidated balance sheets in any year during the period 1992-1999. Both debt and equity are measured at book value. Firms for which shareholder's equity is negative are excluded. Long-term debt to total assets is defined as the book value of long-term debt divided by the book value of total assets.

Long-Term Debt to Total Assets of Private Firms with 50-100 Employees

	1992			1993			1994			1995		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	55	0.08	0.01	104	0.10	0.01	120	0.10	0.01	132	0.10	0.02
Top 25% by total assets	14	0.13	0.00	26	0.15	0.00	30	0.18	0.01	33	0.22	0.11
Second 25% by total assets	14	0.06	0.00	26	0.06	0.00	30	0.06	0.00	33	0.07	0.00
Third 25% by total assets	14	0.06	0.01	26	0.12	0.09	30	0.08	0.05	33	0.07	0.03
Bottom 25% by total assets	13	0.07	0.00	26	0.07	0.00	30	0.08	0.01	33	0.05	0.00
	1996			1997			1998			1999		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	160	0.11	0.01	187	0.11	0.01	202	0.11	0.01	106	0.12	0.01
Top 25% by total assets	40	0.17	0.01	47	0.19	0.03	51	0.19	0.00	27	0.20	0.01
Second 25% by total assets	40	0.11	0.06	47	0.08	0.01	51	0.08	0.00	27	0.07	0.00
Third 25% by total assets	40	0.08	0.01	47	0.08	0.00	50	0.10	0.04	26	0.16	0.12
Bottom 25% by total assets	40	0.06	0.00	46	0.08	0.00	50	0.08	0.01	26	0.05	0.01

Source: Reach Database

Table XVIII: Extent of Leverage in Netherlands – Long-Term Debt to Capital Ratios of Private Firms (50-100 Employees)

Long-Term Debt to capital ratios are calculated for all non-financial private companies (with 50-100 employees) reporting consolidated balance sheets in any year during the period 1992-1999. Both debt and equity are measured at book value. Firms for which shareholder's equity is negative are excluded. Long-term debt to capital is defined as the book value of long-term debt divided by the sum of the book value of debt and equity.

Long-Term Debt to Capital of Private Firms with 50-100 Employees

	1992			1993			1994			1995		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	55	0.09	0.01	104	0.11	0.01	120	0.11	0.01	132	0.11	0.02
Top 25% by total assets	14	0.14	0.00	26	0.16	0.00	30	0.19	0.01	33	0.23	0.12
Second 25% by total assets	14	0.06	0.00	26	0.07	0.00	30	0.07	0.00	33	0.08	0.01
Third 25% by total assets	14	0.07	0.01	26	0.13	0.10	30	0.09	0.05	33	0.08	0.04
Bottom 25% by total assets	13	0.08	0.00	26	0.08	0.00	30	0.08	0.01	33	0.06	0.00

	1996			1997			1998			1999		
	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
All firms	160	0.11	0.01	189	0.11	0.01	202	0.12	0.01	106	0.13	0.01
Top 25% by total assets	40	0.19	0.04	47	0.20	0.03	51	0.20	0.00	27	0.22	0.01
Second 25% by total assets	40	0.11	0.06	47	0.09	0.01	51	0.08	0.00	27	0.07	0.00
Third 25% by total assets	40	0.08	0.01	47	0.08	0.00	50	0.11	0.04	26	0.17	0.12
Bottom 25% by total assets	40	0.06	0.00	48	0.08	0.00	50	0.08	0.01	26	0.05	0.02

Source: Reach Database

Table XIX: Leverage and Life Cycle Effects in the Netherlands – Debt to Total Assets Ratios of Listed Firms

Debt to Total Assets ratios are calculated as a function of firm maturity (since the year of incorporation in Panel A, and since the year of listing in Panel B) for all non-financial listed companies reporting consolidated balance sheets in any year during the period 1993-1999. Both debt and equity are measured at book value. Firms for which shareholder's equity is negative are excluded. Debt to total assets is defined as the book value of short-term plus long-term debt divided by the book value of total assets.

Panel A: Debt to Total Assets of Publicly Listed Firms as a Function of Maturity in Years since Incorporation

	1993			1994			1995			1996		
Firm Maturity (in years)	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
Less than 10 years	8	0.55	0.53	9	0.54	0.52	9	0.49	0.50	10	0.47	0.53
Between 10 and 30 years	26	0.53	0.57	29	0.54	0.54	30	0.56	0.57	33	0.56	0.56
Larger than 30 years	67	0.49	0.51	70	0.49	0.52	73	0.51	0.54	74	0.53	0.53

	1997			1998			1999		
Firm Maturity (in years)	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
Less than 10 years	11	0.51	0.51	15	0.53	0.57	22	0.56	0.60
Between 10 and 30 years	39	0.53	0.56	39	0.60	0.61	37	0.59	0.63
Larger than 30 years	75	0.53	0.55	81	0.53	0.54	80	0.54	0.58

Panel B: Debt to Total Assets of Publicly Listed Firms as a Function of Maturity in Years since Listing

	1993			1994			1995			1996		
Firm Maturity (in years)	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
Less than 10 years	42	0.52	0.53	49	0.52	0.52	52	0.54	0.55	56	0.54	0.58
Between 10 and 30 years	28	0.52	0.57	22	0.51	0.58	23	0.52	0.56	23	0.55	0.59
Larger than 30 years	38	0.49	0.51	37	0.49	0.52	37	0.50	0.52	38	0.51	0.52

	1997			1998			1999		
Firm Maturity (in years)	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
Less than 10 years	56	0.53	0.54	49	0.56	0.57	50	0.58	0.60
Between 10 and 30 years	29	0.55	0.57	45	0.56	0.58	48	0.55	0.59
Larger than 30 years	40	0.52	0.54	41	0.54	0.52	41	0.54	0.60

Source: Reach Database

Table XX: Leverage and Life Cycle Effects in the Netherlands – Debt to Total Assets Ratios of Private Firms

Debt to Total Assets ratios are calculated as a function of firm maturity (in years since year of incorporation) for all non-financial private companies reporting consolidated balance sheets in any year during the period 1992-1999. Both debt and equity are measured at book value. Firms for which shareholder's equity is negative are excluded. Debt to total assets is defined as the book value of short-term plus long-term debt divided by the book value of total assets.

Panel A: Debt to Total Assets of Private Firms with 10-50 Employees

	1992			1993			1994			1995		
Firm Maturity (in years)	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
Less than 10 years	9	0.86	0.89	13	0.77	0.86	17	0.74	0.77	23	0.73	0.81
Between 10 and 30 years	22	0.76	0.79	36	0.74	0.78	40	0.75	0.77	41	0.72	0.75
Larger than 30 years	3	0.67	0.87	11	0.53	0.51	16	0.59	0.65	23	0.58	0.69

	1996			1997			1998			1999		
Firm Maturity (in years)	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
Less than 10 years	33	0.72	0.77	48	0.66	0.73	44	0.63	0.68	27	0.69	0.76
Between 10 and 30 years	45	0.71	0.76	53	0.69	0.73	56	0.69	0.73	29	0.76	0.79
Larger than 30 years	24	0.62	0.66	30	0.58	0.61	33	0.60	0.64	27	0.57	0.57

Panel B: Debt to Total Assets of Private Firms with 50-100 Employees

	1992			1993			1994			1995		
Firm Maturity (in years)	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
Less than 10 years	18	0.71	0.70	34	0.64	0.70	36	0.66	0.65	38	0.63	0.67
Between 10 and 30 years	19	0.52	0.50	33	0.63	0.68	41	0.64	0.72	49	0.64	0.66
Larger than 30 years	18	0.55	0.55	36	0.49	0.53	42	0.53	0.55	44	0.59	0.63

	1996			1997			1998			1999		
Firm Maturity (in years)	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median	Number of Firms	Mean	Median
Less than 10 years	46	0.62	0.62	55	0.64	0.67	62	0.64	0.68	28	0.69	0.73
Between 10 and 30 years	61	0.61	0.66	72	0.63	0.67	75	0.60	0.66	44	0.62	0.65
Larger than 30 years	52	0.57	0.62	59	0.56	0.57	63	0.55	0.55	32	0.55	0.55

Source: Reach Database

3 The Determination of Bank Lending Rates: Evidence for the Netherlands and Other Countries

3.1 Introduction

In the first part of this study, we established that the financial system in the Netherlands can be viewed as being bank-dominated, and displays large similarities with the financial system in Germany. In both countries, the bank sectors are highly concentrated, and are dominated by a small number of large, universal banks.[1] Furthermore, both countries are characterized by the lack of a significant corporate bond market. The financial systems in the US and UK, on the other hand, are market-oriented. In the US, both the equity and the corporate bond market play an important role in the financing of non-financial firms. In the UK, however, the corporate bond market is insignificant and the role of the equity market is supplemented by a substantial degree of bank financing.

In this chapter, we examine how the differences and similarities between the financial systems in the US, the UK, Germany and the Netherlands – and in particular those with respect to the role of banks – are reflected in loan pricing, i.e., in the determination of bank prime (base) lending rates and the size of bank spreads (i.e., the margin of banks' prime lending rates over their cost of funds). An analysis of bank lending rates is useful, since the pricing of loans affects the comparative advantages of bank financing vis-à-vis financial market financing for firms in the different countries.[2] Such an analysis can furthermore shed some light on the degree of competitiveness of the banking sectors in the respective economies.

In order to examine the determinants of bank prime lending rates, we use monthly Datastream data on both bank and bond rates in the US, the UK, Germany and the Netherlands for the period 1986-1998. Using these data, we first document the correlation, or co-movement, between prime lending rates and market-determined rates (i.e., government bond rates) in the four countries. We then shift our focus to an analysis of the determinants of the relative size of the spread between bank prime lending rates and bank borrowing rates (the bank spread, or 'intermediation spread'), and link this spread to three explanatory factors: the volatility in the banks' cost of funding, regulation and the competitive structure of the banking industry. Finally, we examine the sensitivity of bank prime lending rates to underlying changes in the banks' cost of funds. This exercise allows us to draw inferences regarding the 'stickiness' of bank lending rates over time, and has potential implications for the competitiveness of the bank loan (or credit) markets in the different countries.

1 A more detailed description of the (competitive) structure of the Dutch banking sector will be given in Chapter 4.

2 It should be recognized that the interest rate is only one facet of the cost of bank borrowing. Additional factors that affect the overall cost of borrowing include fees, collateral requirements, covenants and even bankruptcy regulation. These 'non-price' features of debt contracts are addressed in our next chapter. Observe also that our focus in this chapter is on the determination of the bank prime lending rate. The prime lending rate is the base rate for the determination of interest rate on loans to individual firms (see also Section 2). We therefore ignore the 'credit spread', which reflects the credit risk of an individual borrower and has to be added to the base rate in order to determine its borrowing cost. Some general comments on the differences between credit spreads across countries can also be found in Chapter 4.

The organization of this chapter is as follows. Section 3.2 provides an introduction to the prime lending rate, and documents the correlations between bank lending rates and government bond market rates, both within and across the four countries. In Section 3.3, we present the evidence with respect to the size and determinants of the intermediation spreads. Section 3.4 discusses the sensitivity of prime rates to banks' costs of funding, and its determinants. Section 3.5 concludes.

3.2 The Prime Rate and Its Correlation with Market Interest Rates and Across Countries

As indicated above, the prime rate is the lending rate on which banks base the interest rate they charge on loans to borrowers. Apart from macro-economic factors, this base rate depends on the banks' costs of funds. Unlike market interest rates, such as interest rates set in government bond markets, (changes in) bank prime lending rates are in large part administratively determined, and occur relatively infrequently. In the case of the US, for example, the prime rate normally changes only after the occurrence of a 'significant' change in the banks' cost of funds. The change in banks' cost of funds thereby is calculated based on some internal (confidential) cost of funds formula, in which neither the cost of funds measures (and weights) used, nor the ex ante discreteness (or magnitude) of a cost of funds change that triggers a prime rate move, are public information. Ex post, we normally observe prime lending rates to change in increments of 1/4% or more (see Mester and Saunders, 1995). The reasons for both the discreteness in prime rate changes and the 'stickiness' of the prime rate relative to market interest rates vary from explanations relating to the administrative costs faced by banks in adjusting the prices of loan contracts to issues relating to market power. For example, banks with market power may be slow to reflect falling costs of funds in prime lending rates. In contrast, rising costs of funds may be reflected in loan rates more quickly (thus suggesting an asymmetric response by banks to rising and falling funding costs).

Observe that the meaning of the prime rate may be different in different countries, and has evolved over time.[3] In the US, the prime rate used to be the rate paid by the best corporate borrowers. However, with the advent of competition from the short-term commercial paper market and the corporate bond market, it now has greater meaning as a 'base' rate to which (from which) risk-premiums are added (deducted) (see Brady, 1985).[4] Indeed, depending on commercial paper rates, a 'prime' (AAA) borrower can pay anywhere between 1% to 2% below prime rate. Market competition thus has changed the fundamental nature and meaning of the prime rate in the US.[5]

In order to analyze the determination of the prime rates in the US, the UK, Germany

3 To some extent, as the prime rate has evolved to a 'base' rate in the US, the similarity in concept with countries such as the UK, where Clearing banks have traditionally used base-rate pricing, has become closer. Moreover, Datastream claims to have made their definitions of 'prime rate' as similar as possible across countries. Nevertheless, some noise in the definitions clearly remains.

4 In the US, commercial paper is short-term debt extended to external investors with a maturity of 270 days or less (as such it does not have to be registered with the SEC prior to issuance).

5 To some extent, prime rates will also reflect central bank policy. For example, in setting short-term rates that are common under single-currency integration, one would a priori expect more positive correlation between Dutch

and the Netherlands, we use data on key interest rates (both bank and market rates) from Datastream for each of the four countries. We focus on five different interest rates: (*i*) the interest rate on the 10-year benchmark government bond (the most liquid long-term bond in most countries), (*ii*) the interest rate on the current 10-year government bond, (*iii*) the commercial banks' prime rate, (*iv*) the 3-month interbank offer rate, and (*v*) the 3-month bank CD (Certificate of Deposit) rate. The first two rates are long-term interest rates for default risk-free securities in the open market. The last three rates are bank rates, where the third rate (the prime rate) is the main focus of our attention, and where the interbank and CD rates are reflective of the banks' costs of funds. We use monthly data for the period 1986-1998, and collected complete data for all rates except for the 3-month CD rate (the time-series collection of this rate was terminated by Datastream by the end of December 1993).

The *Tables 1* through *4* present the descriptive statistics (i.e., the mean, median, maximum, minimum and standard deviation) for each of the five interest rates for the whole period for which data are available for the Netherlands, Germany, the US respectively the UK. In addition, the tables show correlation matrices for these rates within each country for the whole period (from January 1986 to December 1998) and for two equal sub-periods (from January 1986 to June 1992, and from July 1992 to December 1998). The time series for the prime rates and the 3-month interbank rates for the respective countries are depicted in the *Figures 1* through *4*.

Table 5 shows the correlations for each of the five interest rates across countries. A striking observation that can be made from *Table 5* is, that there is a much higher degree of correlation between bond market rates than among bank interest rates across the four countries. More specifically, while the benchmark bond rates are positively correlated, with correlation coefficients ranging from 0.57 (between Germany and the US) and 0.99 (between Germany and the Netherlands), the correlations for bank interest rates are generally lower, and in some cases even negative. The correlation coefficient between the prime rate for the Netherlands and Germany is relatively high (0.94), and is of a similar magnitude as the correlation between these countries' long-term bond rates. The correlation of the Dutch prime rate with the UK, on the other hand, is 0.60, whereas that with the US is negative and equals -0.08. That is, Dutch banks' prime rates appear to move independently of those in the US. These results suggest that while the EU banking markets (especially those with a common currency) are highly integrated – as was the aim of the European Single Market Directive – the US lending market, and to some extent the UK lending market, are much more separated and segmented internationally. Observe that the 3-month interbank rate shows similar patterns of inter-country correlations with the prime rate.[6] Of all bank rates, the US prime rate has the lowest correlation with other countries. The correlation coefficients between the US prime rate and the

and German prime lending rates, rather than between Dutch and UK respectively Dutch and US lending rates. Note, however, as will be discussed in Section 3, the correlation between Dutch and German lending rates is much lower than that between open market (bond) rates. As such, even with central bank coordination of short-term rates, banks in European Union countries still show some independence in loan rate setting. Thus, these rates can still be used to analyze banking structures in these countries.

6 The CD rate correlations only cover the period 1986-1993, and thus concern the period prior to the EU Single Market Directives.

prime rates in Germany, the Netherlands and the UK are -0.24, -0.08 and 0.63, respectively.

3.3 An International Comparison of the Size and Determinants of the Bank Spread

In this section we focus on the relative 'cost of intermediation' in each of the four countries, and examine the spreads between the commercial banks' prime rate and two measures of the banks' cost of funds: the 3-month interbank offer rate and the 3-month CD rate. On a theoretical level, the intermediation spread will reflect at least three effects (see, for example, Ho and Saunders, 1981, Allen, 1988, and Angbazo, 1997): (*i*) the underlying volatility of the interbank rate (that is, the more volatile the interbank rate, the larger the spread); (*ii*) the costs of regulation and regulatory compliance; and (*iii*) the competitive structure of the banking industry (that is, the more competitive the banking industry, the lower the spread).

With respect to the first effect, the underlying volatility of bank funding rates, we concentrate on the volatility of the interbank offer rate.[7] The *Tables 1* through *4* show that the volatilities of the 3-month interbank rates over our sample period 1986-1998 were respectively 2.19% for the Netherlands, 2.26% for Germany, 1.74% for the US and 3.08% for the UK. That is, the UK had the highest interbank rate volatility and the US the lowest, and the volatilities for Germany and the Netherlands were similar.

With respect to regulation and regulatory compliance, there are at least two types of regulation that may drive a positive wedge between bank lending rates and banks' cost of funds: capital requirements and reserve requirements. Capital requirements limit the leverage of a bank, and may require the bank to raise relatively high-cost external equity to partially fund loans. Reserve requirements require banks to hold either zero or low interest rate assets to mitigate the effects of potential liquidity shocks. A full description of both types of regulation can be found in Saunders (2000).[8] In general, banks in all four countries are subject to the same capital requirement regime set by the Bank for International Settlements, which specifies a capital ratio of 8% against a bank's risk-adjusted assets, plus a mark-up (or add-on) for the bank's exposure to market risk. By comparison, the reserve requirements for each of the four countries have tended to be very idiosyncratic (see Saunders and Schumacher, 2001). However, banks in all countries (except for the Netherlands) failed to receive interest on required reserve balances held at the Central bank over the period 1986-1998.

7 Conceptually, banks are acting like brokers in receiving funds at one price, and placing them as loans at a higher price. If fund supply arrival and loan demand arrival are asynchronous, then banks have to adjust for any shortfalls or excesses in the interbank market. The more volatile the rates in the interbank market are, the higher the spread has to be between the lending and deposit rates. Thus, the intermediation literature, to the extent that it has modeled the determination of bank loan margins, has focused on the bank lending and borrowing rate, and the volatility of the latter rate, as well as competitive market conditions and regulatory frictions (see Ho and Saunders, 1981). The analysis in this chapter follows this theoretical approach.

8 Arguably, a third type of regulation is implicit or explicit deposit insurance. With respect to explicit insurance, the EU countries (The Netherlands, Germany and the UK) are adopting a scheme on individual depositor basis (with an average of 20,000 ECU per depositor) that is less generous than that in the US (which offers $100,000 per depositor). Explicit deposit insurance will tend to lower the cost of deposits. Implicit deposit insurance will lower the cost of interbank funds if banks are bailed out by Central banks upon failure.

The third factor impacting bank spreads is the competitive structure of the banking sector. Here one needs to be careful, however, since a large number of banks does not necessarily imply a competitive commercial lending market with low bank spreads (or intermediation margins). For example, the US currently has just over 8,000 banks (10 years ago there were over 15,000 banks). The principal reasons for this large number of banks were restrictions on inter-state branching (see the McFadden Act of 1927) and on inter-state mergers (see the Bank Holding Company Act of 1956). Furthermore, banks were effectively prohibited from combining commercial lending and investment banking activities (see the Glass-Steagall Act of 1933). It was only with the passage of the Riegle-Neal Banking and Branching Efficiency Act of 1994 (fully implemented in 1997) that US banks could start to put together full nationwide banking networks. Indeed, the dramatic recent contraction in the number of banks in the US is reflective of the enhanced ease with which banks can both acquire other banks and branches. By comparison, the banking systems of the Netherlands, the UK and Germany have been national for much of the last century.[9] This suggests that the domestic competitive playing field is far more similar for Dutch, UK and German banks than for US banks.[10] Furthermore, the Dutch, German and UK banks (since 1986) have relatively greater universal banking powers, and the domestic banking sector is often identified with 3 or 4 major or prominent banks.[11]

We now confront these arguments with our data. *Table 6* shows the mean spreads between the prime rate and the 3-month CD rate (for the period 1986-1993) respectively the 3-month interbank offer rate (for the period 1986-1998) for the four countries. Interestingly, the country with the lowest bank spreads (over both the 3-month CD rate and the interbank rate) is the UK. Indeed, UK bank spreads that are dramatically lower (in the order of magnitude of a factor 2 or more) than those in any of the three other countries. As indicated above, this difference cannot be explained by a lower interest rate volatility (in fact, as discussed earlier, the volatility of UK bank interest rates was the largest of all four countries), neither can it solely be attributed to lower regulatory taxes and costs.[12] This suggests that the low bank spreads in the UK relative to other countries are consistent with a relatively competitive banking system. Recall that *Table 1A* in Chapter 1 shows that the depth of the credit market in the UK was the highest among the four countries in 1997 (in comparison to it being the lowest in 1986). An interesting puzzle that emerges from this earlier study is that listed non-financial firms in the UK are, on average, less leveraged than firms in the Netherlands, Germany or the US, despite the low bank spreads and the large depth of the credit market.[13] The US, with a

9 For example, much of the concentration and merger activity in the UK took place in the pre-World War I period (see Saunders and Wilson, 2000).

10 Observe also that most of the bank mergers that took place in these countries were domestic consolidations. Only recently, a few cross-border acquisitions have been observed in Europe (see Boot and Schmeits, 1999).

11 While rapid consolidation has recently taken place in the US, no bank has more than a 10% share of the national deposit market.

12 Although the required reserve ratio in the UK is the lowest of all four countries, capital requirements are similar across countries (see Saunders, 2000).

13 As indicated in footnote 18 in Chapter 1, this observation may partially be explained by the existence of low underwriting spreads on new equity issues in the UK (see Ljundqvist, 2000).

large equity and bond market but a regionally constrained banking system, and Germany, with a small equity market and a small non-financial segment of the corporate bond market but a national universal banking system, had the largest spreads (approximately equal to 2%, relative to both the CD and the interbank rate).[14] The bank spreads in the Netherlands are slightly lower than those in either the US or Germany, but significantly higher than those in the UK. As a final remark, from a public policy perspective, the effect of London as an international financial center aligned with the relative ease of entry of foreign banks into both the UK domestic market (since 1986) and the Euromarkets (since the early 1960's) appears to have had a material effect on the level of UK intermediation spreads.[15]

3.4 An International Comparison of the Sensitivity of Bank Lending Rates to Changes in Banks' Cost of Funds

As indicated in *Table 5*, commercial banks' prime rates seem to be more weakly correlated across countries than market rates (such as government bond rates). Since prime rates are administered rates that reflect levels (and changes in the levels) of bank funding costs, as well as the competitive and regulatory structure of those systems, a partial explanation for the low correlations between these rates across countries may be differences in the spread and/or differences in the sensitivity of prime rate changes relative to banks' costs of funds across these countries. In particular, an analysis of the speed of reaction (or stickiness) of bank prime rate changes to changes in underlying funding costs may provide additional insights in the competitive nature of the banking system.[16] For example, a banking system that is fairly slow in passing on funding cost reductions to borrowers in the form of lower rates may be viewed as relatively uncompetitive.[17]

In order to address this issue, we perform simple OLS-regressions linking monthly changes in the commercial banks' prime rate in each of the four countries to monthly changes in two measures of banks' costs of funds: the contemporaneous change in the 3-month interbank offer rate and the contemporaneous change in the 3-month CD rate. The prime rate sensitivity is measured over the whole sample period (1986-1998) and two equal sub-periods (1986-1992 and 1992-1998). In addition, separate regressions are

14 Observe that for the US the spreads are larger, despite a lower volatility in the 3-month interbank offer rate during the period 1986-1998.

15 It might also be noted that the level of UK rates (on average) was higher than in the other countries. Thus, calculating spreads relative to the level of the respective interest rates makes spreads in the UK look even more favorable.

16 For example, if prime rates are sticky in a downward direction, this may reflect market power of banks, in being able to avoid passing cost of fund declines on to their customers in a timely fashion.

17 On the other hand, it could be argued that a low sensitivity of the prime rate to changes in banks' cost of funds may reflect a willingness of banks to smooth interest rate changes over time for borrowers with which they have entered into customer-relationships (see for example, Sharpe, 1991, and Petersen and Rajan, 1995). Banks thus may absorb interest rate shocks as part of their overall relationship with firms. Two observations seem to be less supportive of this line of argument. First, smoothing in the interest rate that borrowers pay on their loans does not necessarily have to occur at the level of the bank prime rate. Instead, banks are more likely to 'smooth' at the level of the credit spread charged to individual borrowers. Second, the smoothing argument seems to be less consistent with the asymmetry in prime rate responses to increases versus decreases in bank cost of funds (see later in this section). An alternative explanation for loan rate asymmetry may be the use of fixed-rate advances or loan commitments that customers can use instead of spot loans based on prime (Unfortunately, there is little information on the maturity, use

run to examine the sensitivity of prime rate changes to respectively *increases* and *decreases* in the two measures of the banks' cost of funds. This allows us to analyze to what extent higher (lower) bank funding costs are immediately passed on to borrowers. As indicated earlier, a tendency to fully pass on cost of fund increases, while limiting the passing on of cost of fund decreases by banks would raise questions about the competitiveness of the banking system with respect to loan pricing. The results of all regressions are reported in the *Tables 7* through *22*.

We first concentrate on the *Tables 7*, *11*, *15* and *19*, which show the sensitivity of prime rate changes relative to changes in the 3-month interbank rate for the full sample period. As might be expected, given our earlier results, the UK prime rate is the most sensitive to cost of fund changes, with a 1% change in the interbank rate leading to a contemporaneous 0.7% change in the prime rate. The next most sensitive is the Netherlands (with a coefficient of 0.55%). The prime rates in the US and Germany respond the least to changes in the interbank rate (with coefficients of 0.33% and 0.27%, respectively).

Of particular interest is the degree of asymmetry in the response of prime rate changes to *positive* versus *negative* changes in banks' cost of funds. *Table 7* shows that for the Netherlands, there is a slightly larger prime rate response to a 1% cost of fund increase than to a decrease (the coefficients are 0.65% versus 0.58%, measured relative to the 3-month interbank rate). For Germany we observe a larger asymmetry (with coefficients equal to 0.46% versus 0.12%, see *Table 11*). The results for the US again are very similar to those of Germany (with coefficients of 0.5% and 0.128%, *see Table 15*). Finally, for the UK we find virtually no asymmetry, and a high degree of sensitivity of prime rate changes to both increases and decreases in funding costs (with coefficients of 0.87% and 0.84%, see *Table 19*). These results again suggest that, in terms of the determination of the prime rate, the UK banking system is highly competitive and quickly reflects both cost of fund increases and decreases in loan pricing. By comparison, the downward stickiness of the prime rates in the US and Germany is consistent with a relatively uncompetitive banking system, in that cost of fund decreases are not immediately passed on to borrowers. This observation is also reflected in the relatively high intermediation spreads, reported earlier in *Table 6*. Finally, the results for the Netherlands imply that in comparison to Germany and the US, the base lending rate in the Netherlands appears to be reset more frequently as the cost of funds changes. That is, the big Dutch banks appear to operate in a world of oligopolistic competition in terms of intermediation spreads. The

and pricing of loan commitments across countries, although Jacobs and Toolsema (2001) provide evidence on mortgage rates for the Netherlands). In a world where banks offer loan commitments as well as spot loans, they are providing very valuable put options to customers. For example, if the spot rate rises above the loan commitment rate, the bank stands to lose money with loan commitments (since borrowers will choose to borrow at the lower loan commitment rate). By contrast, if spot rates fall, then (rationally) customers will not draw on their loan commitments, and banks will retain fees and other charges from the provision of such commitments. To avoid losses of loan commitment provision (when rates are expected to rise), banks may shorten the period of commitment offering, leading (on average) to a more frequent adjustment of commitment rates in the upward direction. By contrast, the pressure to cut commitment periods (if interest rates are expected to fall), leads to a less intense pressure to cut loan commitment rates. Since banks are seeking to manage their interest rate risk, such concerns are consistent with an asymmetry of loan (commitment) rate response. Finally, it might be noted that most commercial loan commitment rates in the US are floating rather than fixed (see Shockley and Thakor, 1997), and most are based on LIBOR rather than prime.

'average' spread is larger as compared to the UK, where there is more external competition to the big 4 banks. Nevertheless, within the Dutch market, the adjustment of rates around this average spread is quite fast, indicating that none of the big 4 banks is sufficiently strong to act independently and ignore cost of fund changes for very long.

We finally performed regressions allowing for a lagged response of the prime rate to cost of fund changes. If, as implied by the *Tables 7* through *22*, loan rates in the US and Germany are relatively 'sticky' with respect to cost of fund changes (in particular in the downward direction), then we might expect lagged changes in the 3-month interbank rate to have a greater effect on current prime rate changes than current changes in the cost of funds. In these regressions, we also controlled for the level of interest rates and lagged changes in the prime rate itself. The results of these 'lagged regressions' for the Netherlands, Germany, the US and the UK for the full sample period are reported in the *Tables 23* through *26*.

Table 23 shows that in the Netherlands, the current (contemporaneous) change in the 3-month interbank rate has a more powerful effect on the change in the prime rate than either the 1-month or the 2-month lagged changes. By comparison, for both the US and Germany, the prime rate is more sensitive (in the case of the US much more sensitive) to the 1-month lagged change in the interbank rate relative to the contemporaneous change in the cost of funds (see *Table 24* and *Table 25*). Finally, for the UK, the contemporaneous change in the cost of funds dominates any lagged changes in the interbank rate in impacting movements in the prime rate (*see Table 26*).

Overall, the results in this section are consistent with a high level of intermediation efficiency and competition in the UK, especially when compared to either the US or Germany. The Netherlands appears to fall in between the US and Germany, on the one hand, and the UK on the other.

3.5 Summary and Conclusions

In this chapter we focused on the determination of the prime rate (the base bank lending rate) in the Netherlands, Germany, the US and the UK. We used monthly information on both bank and market interest rates from Datastream for the period 1986-1998 in order to examine (*i*) the correlation between bank and market interest rates within and across countries; (*ii*) the relative size and the determinants of bank or intermediation spreads (i.e., the margin of prime rates over banks' costs of funds); and (*iii*) the sensitivity of prime rate changes to changes in the banks' cost of funds.

Our analysis indicates that, in comparison to government bond market rates, prime rates appear to be poorly integrated internationally. This can be explained by the fact that prime rates are administered rates and thus to a large extent are formula-driven. In addition, the competitive structure of the domestic banking industry appears to affect both the level of bank spreads and the sensitivity of prime rate changes to domestic cost of fund changes. Based on a comparison of both the relative size of intermediation spreads, and the relative speed and asymmetry of prime loan rate responses to cost of

fund changes, we conclude that the UK appears to have the most competitive commercial lending market (in terms of loan pricing), whereas the US and Germany seem to be the least competitive. The competitivenss of the banking sector in the Netherlands appears to be higher than that in the US and Germany, but lower than in the UK.

Table 1: The Netherlands

Descriptive Statistics

	10 Year Benchmark Bond	Government Bond	Commercial Banks Prime Rate	Interbank 3 Month Offered Rate	Commercial Banks 3 Month Deposit Rate
Mean %	6.8008	6.7762	7.7049	5.8576	7.0842
Median %	6.5550	6.4800	7.0000	5.3750	7.0750
Maximum	9.3080	9.2000	11.7500	9.7850	9.8200
Minimum	3.9480	3.9800	4.2500	2.6750	3.5000
Std. Dev.	1.2264	1.2245	2.3549	2.1940	1.8424
Observations	156	156	156	156	96

Correlation Matrix (whole sample)

	10 Year Benchmark Bond	Government Bond	Commercial Banks Prime Rate	Interbank 3 Month Offered Rate	Commercial Banks 3 Month Deposit Rate
10 Year Benchmark Bond	1.0000	0.9744	0.8154	0.8793	0.8581
Government Bond	0.9744	1.0000	0.8549	0.9058	0.8931
Commercial Banks Prime Rate	0.8154	0.8549	1.0000	0.9821	0.9841
Interbank 3 Month Offered Rate	0.8793	0.9058	0.9821	1.0000	0.9949
Commercial Banks 3 Month Deposit Rate	0.8581	0.8931	0.9841	0.9949	1.0000

Table 1: The Netherlands (Continued)

Correlation Matrix (01/86 — 06/92)

	10 Year Benchmark Bond	Government Bond	Commercial Banks Prime Rate	Interbank 3 Month Offered Rate	Commercial Banks 3 Month Deposit Rate
10 Year Benchmark Bond	1.0000	0.9763	0.8953	0.9194	0.9023
Government Bond	0.9763	1.0000	0.9096	0.9287	0.9195
Commercial Banks Prime Rate	0.8953	0.9096	1.0000	0.9895	0.9888
Interbank 3 Month Offered Rate	0.9194	0.9287	0.9895	1.0000	0.9950
Commercial Banks 3 Month Deposit Rate	0.9023	0.9195	0.9888	0.9950	1.0000

Correlation Matrix (07/92 — 12/98)

	10 Year Benchmark Bond	Government Bond	Commercial Banks Prime Rate	Interbank 3 Month Offered Rate	Commercial Banks 3 Month Deposit Rate
10 Year Benchmark Bond	1.0000	0.9769	0.9697	0.9740	0.9713
Government Bond	0.9769	1.0000	0.9674	0.9684	0.9682
Commercial Banks Prime Rate	0.9697	0.9674	1.0000	0.9883	0.9911
Interbank 3 Month Offered Rate	0.9740	0.9684	0.9883	1.0000	0.9958
Commercial Banks 3 Month Deposit Rate	0.9713	0.9682	0.9911	0.9958	1.000

Table 2: Germany

Descriptive Statistics

	10 Year Benchmark Bond	Government Bond	Commercial Banks Prime Rate	Interbank 3 Month Offered Rate	Commercial Banks 3 Month Deposit Rate
Mean %	6.6731	6.7232	7.6769	5.7624	6.1749
Median %	6.5685	6.4500	7.1250	5.0000	6.4400
Maximum	9.1200	9.0500	11.5000	9.9375	8.9800
Minimum	3.8750	3.8400	4.5000	3.1250	3.0500
Std. Dev.	1.1453	1.1935	2.2488	2.2669	1.9252
Observations	156	156	156	156	96

Correlation Matrix (whole sample)

	10 Year Benchmark Bond	Government Bond	Commercial Banks Prime Rate	Interbank 3 Month Offered Rate	Commercial Banks 3 Month Deposit Rate
10 Year Benchmark Bond	1.0000	0.9523	0.7490	0.8344	0.8272
Government Bond	0.9523	1.0000	0.8235	0.8733	0.8740
Commercial Banks Prime Rate	0.7490	0.8235	1.0000	0.9422	0.9510
Interbank 3 Month Offered Rate	0.8344	0.8733	0.9422	1.0000	0.9959
Commercial Banks 3 Month Deposit Rate	0.8272	0.8740	0.9510	0.9959	1.0000

Table 2: Germany (Continued)

Correlation Matrix (01/86 — 06/92)

	10 Year Benchmark Bond	Government Bond	Commercial Banks Prime Rate	Interbank 3 Month Offered Rate	Commercial Banks 3 Month Deposit Rate
10 Year Benchmark Bond	1.0000	0.9527	0.8663	0.8890	0.8856
Government Bond	0.9527	1.0000	0.9434	0.9251	0.9304
Commercial Banks Prime Rate	0.8663	0.9434	1.0000	0.9499	0.9578
Interbank 3 Month Offered Rate	0.8890	0.9251	0.9499	1.0000	0.9963
Commercial Banks 3 Month Deposit Rate	0.8856	0.9304	0.9578	0.9963	1.0000

Correlation Matrix (07/92 — 12/98)

	10 Year Benchmark Bond	Government Bond	Commercial Banks Prime Rate	Interbank 3 Month Offered Rate	Commercial Banks 3 Month Deposit Rate
10 Year Benchmark Bond	1.0000	0.9650	0.9105	0.9734	0.9462
Government Bond	0.9650	1.0000	0.8960	0.9560	0.9328
Commercial Banks Prime Rate	0.9105	0.8960	1.0000	0.9591	0.9804
Interbank 3 Month Offered Rate	0.9734	0.9560	0.9591	1.0000	0.9867
Commercial Banks 3 Month Deposit Rate	0.9462	0.9328	0.9804	0.9867	1.0000

Table 3: US

Descriptive Statistics

	10 Year Benchmark Bond	Government Bond	Commercial Banks Prime Rate	Interbank 3 Month Offered Rate	Commercial Banks 3 Month Deposit Rate
Mean %	7.2425	7.4350	8.3484	6.1810	6.3567
Median %	7.2185	7.5250	8.5000	5.8750	6.6450
Maximum	9.6000	9.7000	11.5000	10.3125	10.2100
Minimum	4.4130	4.4100	6.0000	3.1875	3.0800
Std. Dev.	1.2041	1.1634	1.3740	1.7419	2.0577
Observations	156	156	156	156	96

Correlation Matrix (whole sample)

	10 Year Benchmark Bond	Government Bond	Commercial Banks Prime Rate	Interbank 3 Month Offered Rate	Commercial Banks 3 Month Deposit Rate
10 Year Benchmark Bond	1.0000	0.9136	0.8260	0.8817	0.8768
Government Bond	0.9136	1.0000	0.7474	0.7700	0.7789
Commercial Banks Prime Rate	0.8260	0.7474	1.0000	0.9645	0.9807
Interbank 3 Month Offered Rate	0.8817	0.7700	0.9645	1.0000	0.9945
Commercial Banks 3 Month Deposit Rate	0.8768	0.7789	0.9807	0.9945	1.0000

Table 3: US (Continued)

Correlation Matrix (01/86 — 06/92)

	10 Year Benchmark Bond	Government Bond	Commercial Banks Prime Rate	Interbank 3 Month Offered Rate	Commercial Banks 3 Month Deposit Rate
10 Year Benchmark Bond	1.0000	0.8234	0.6585	0.7518	0.7478
Government Bond	0.8234	1.0000	0.5603	0.5780	0.6028
Commercial Banks Prime Rate	0.6585	0.5603	1.0000	0.9308	0.9635
Interbank 3 Month Offered Rate	0.7518	0.5780	0.9308	1.0000	0.9885
Commercial Banks 3 Month Deposit Rate	0.7478	0.6028	0.9635	0.9886	1.0000

Correlation Matrix (07/92 — 12/98)

	10 Year Benchmark Bond	Government Bond	Commercial Banks Prime Rate	Interbank 3 Month Offered Rate	Commercial Banks 3 Month Deposit Rate
10 Year Benchmark Bond	1.0000	0.9101	0.0566	0.5071	0.5887
Government Bond	0.9101	1.0000	-0.2453	0.2524	0.3607
Commercial Banks Prime Rate	0.0566	-0.2453	1.0000	0.9798	0.0000
Interbank 3 Month Offered Rate	0.5071	0.2524	0.9798	1.0000	0.9554
Commercial Banks 3 Month Deposit Rate	0.5887	0.3607	0.0000	0.9554	1.0000

Table 4: UK

Descriptive Statistics

	10 Year Benchmark Bond	Government Bond	Commercial Banks Prime Rate	Interbank 3 Month Offered Rate	Commercial Banks 3 Month Deposit Rate
Mean %	8.7467	8.7628	10.0994	9.2427	10.7643
Median %	8.9645	8.9450	9.5000	8.7813	10.6100
Maximum	12.8400	12.4500	16.0000	15.5000	15.2500
Minimum	4.3570	4.8100	6.2500	5.1875	5.2800
Std. Dev.	1.6785	1.5077	3.1090	3.0867	2.8327
Observations	152	156	156	156	96

Correlation Matrix (whole sample)

	10 Year Benchmark Bond	Government Bond	Commercial Banks Prime Rate	Interbank 3 Month Offered Rate	Commercial Banks 3 Month Deposit Rate
10 Year Benchmark Bond	1.0000	0.9270	0.8598	0.8758	0.8721
Government Bond	0.9270	1.0000	0.8027	0.8017	0.8023
Commercial Banks Prime Rate	0.8598	0.8027	1.0000	0.9959	0.9971
Interbank 3 Month Offered Rate	0.8758	0.8017	0.9959	1.0000	0.9986
Commercial Banks 3 Month Deposit Rate	0.8721	0.8023	0.9971	0.9986	1.0000

Table 4: UK (Continued)

Correlation Matrix (01/86 — 06/92)

	10 Year Benchmark Bond	Government Bond	Commercial Banks Prime Rate	Interbank 3 Month Offered Rate	Commercial Banks 3 Month Deposit Rate
10 Year Benchmark Bond	1.0000	0.8570	0.7124	0.7374	0.7305
Government Bond	0.8570	1.0000	0.6333	0.6243	0.6264
Commercial Banks Prime Rate	0.7124	0.6333	1.0000	0.9927	0.9953
Interbank 3 Month Offered Rate	0.7374	0.6243	0.9927	1.0000	0.9975
Commercial Banks 3 Month Deposit Rate	0.7305	0.6264	0.9953	0.9975	1.0000

Correlation Matrix (07/92 — 12/98)

	10 Year Benchmark Bond	Government Bond	Commercial Banks Prime Rate	Interbank 3 Month Offered Rate	Commercial Banks 3 Month Deposit Rate
10 Year Benchmark Bond	1.0000	0.9054	0.8288	0.8648	0.8590
Government Bond	0.9054	1.0000	0.7018	0.7122	0.7146
Commercial Banks Prime Rate	0.8288	0.7018	1.0000	0.9899	0.9926
Interbank 3 Month Offered Rate	0.8648	0.7122	0.9899	1.0000	0.9964
Commercial Banks 3 Month Deposit Rate	0.8590	0.7146	0.9926	0.9964	1.0000

Table 5: Correlations Between Countries

Prime Rate (level)
Correlation Matrix

	Germany	The Netherlands	UK	US
Germany	1.0000	0.9412	0.4167	-0.2406
The Netherlands	0.9412	1.0000	0.6049	-0.0816
UK	0.4167	0.6049	1.0000	0.6318
US	-0.2406	-0.0816	0.6318	1.0000

Government Bond Yield (level)
Correlation Matrix

	Germany	The Netherlands	UK	US
Germany	1.0000	0.9932	0.7632	0.5882
The Netherlands	0.9932	1.0000	0.7705	0.6000
UK	0.7632	0.7705	1.0000	0.8692
US	0.5882	0.6000	0.8692	1.0000

Benchmark Bond Rate (level)
Correlation Matrix

	Germany	The Netherlands	UK	US
Germany	1.0000	0.9891	0.7528	0.5735
The Netherlands	0.9891	1.0000	0.7830	0.5936
UK	0.7528	0.7830	1.0000	0.8475
US	0.5735	0.5936	0.8475	1.0000

Commercial Bank 3 Month Deposit Rate (level)
Correlation Matrix

	Germany	The Netherlands	UK	US
Germany	1.0000	0.9836	0.8090	0.3124
The Netherlands	0.9836	1.0000	0.8649	0.3356
UK	0.8090	0.8649	1.0000	0.3132
US	0.3124	0.3356	0.3132	1.0000

Interbank 3 Month Offer Rate (level)
Correlation Matrix

	Germany	The Netherlands	UK	US
Germany	1.0000	0.9722	0.5278	-0.0669
The Netherlands	0.9722	1.0000	0.6424	0.0592
UK	0.5278	0.6424	1.0000	0.7294
US	-0.0669	0.0592	0.7294	1.0000

Table 6: Prime Rates vs Short-Term Interest Rates

Prime Rate vs. Commercial Bank 3 Month Deposit Rate

Period: 01/86-12/93 **Number of observations: 96**

	Prime Rate (Mean)	*CD Rate (Mean)*	*Prime rate - CD rate (Mean)*
Germany	8.7240	6.1749	2.5491
The Netherlands	9.0700	7.0842	1.9858
UK	11.8021	10.7643	1.0378
US	8.4245	6.3567	2.0678

Prime Rate vs. 3 Month Interbank Offer Rate

Period: 01/86-12/98 **Number of observations: 156**

	Prime Rate (Mean)	*Interbank 3 month (Mean)*	*Prime rate - Interbank rate (Mean)*
Germany	7.6769	5.7624	1.9145
The Netherlands	7.7049	5.8576	1.8473
UK	10.0994	9.2427	0.8566
US	8.3484	6.1810	2.1674

Table 7: Prime Rate Changes' Sensitivities to Changes in Interbank Lending Rate The Netherlands, 1986 – 1998

Whole sample: 02/86 – 12/98 No. of observations : 155

dPt = Prime rate(t) - prime rate (t-1)

dIBt = Interbank rate(t) - interbank rate(t-1)
No. of zeros in dIBt: 4

D+dIBt = dIBt if dIBt > 0
= NA if dIBt < = 0

D-dIBt = NA if dIBt > 0
= dIBt if dIBt < = 0

Dependent Variable: dPt
Method: Least Squares
Included observations: 155 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0055	0.0177	-0.3098	0.7572
dIBt	0.5512	0.0672	8.2051	0.0000

R-squared	0.3056	S.E. of regression	0.2202
Adjusted R-squared	0.3010	Sum squared residual	7.4212

Dependent Variable: dPt
Method: Least Squares
Included observations: 73

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0368	0.0382	-0.9635	0.3386
D+dIBt	0.6537	0.1452	4.5009	0.0000

R-squared	0.222	S.E. of regression	0.2296
Adjusted R-squared	0.2110	Sum squared residual	3.7416

Dependent Variable: dPt
Method: Least Squares
Included observations: 78

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	0.0136	0.0386	0.352	0.7258
D-dIBt	0.5895	0.1423	4.1422	0.0001

R-squared	0.1842	S.E. of regression	0.2185
Adjusted R-squared	0.1734	Sum squared residual	3.6293

Table 8: Prime Rate Changes' Sensitivities to Changes in Interbank Lending Rate The Netherlands, 1986 – 1992

Sample period: 01/86 – 06/92 No. of observations : 77

dPt = Prime rate(t) - prime rate (t-1)

dIBt = Interbank rate(t) - interbank rate(t-1)
No. of zeros in dIBt: 2

D+dIBt = dIBt if dIBt > 0
= NA if dIBt < = 0

D-dIBt = NA if dIBt > 0
= dIBt if dIBt < = 0

Dependent Variable: dPt
Method: Least Squares
Included observations: 77 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	0.0292	0.0308	0.9478	0.3463
dIBt	0.5452	0.0996	5.4721	0.0000

R-squared	0.2853	S.E. of regression	0.2671
Adjusted R-squared	0.2758	Sum squared residual	5.3491

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1986:02 1992:06
Included observations: 45

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0027	0.0573	-0.047	0.9628
D+dIBt	0.6231	0.1788	3.4852	0.0011

R-squared	0.2203	S.E. of regression	0.2597
Adjusted R-squared	0.2021	Sum squared residual	2.8990

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1986:03 1992:05
Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	0.0788	0.0832	0.9467	0.3519
D-dIBt	0.6635	0.2754	2.4094	0.0228

R-squared	0.1717	S.E. of regression	0.2926
Adjusted R-squared	0.1421	Sum squared residual	2.3968

Table 9: Prime Rate Changes' Sensitivities to Changes in Interbank Lending Rate The Netherlands, 1992 – 1998

Sample period: 07/92 – 12/98 No. of observations : 78

dPt = Prime rate(t) - prime rate (t-1)

dIBt = Interbank rate(t) - interbank rate(t-1)
No. of zeros in dIBt: 2

D+dIBt = dIBt if dIBt > 0
= NA if dIBt < = 0

D-dIBt = NA if dIBt > 0
= dIBt if dIBt < = 0

Dependent Variable: dPt
Method: Least Squares
Included observations: 78

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0474	0.0192	-2.476	0.0155
dIBt	0.4510	0.0913	4.9374	0.0000

R-squared	0.2429	S.E. of regression	0.1565
Adjusted R-squared	0.2329	Sum squared residual	1.8613

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1992:09 1998:12
Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	0.0087	0.0614	0.1410	0.8889
D+dIBt	-0.1614	0.4883	-0.3306	0.7436

R-squared	0.0042	S.E. of regression	0.1620
Adjusted R-squared	-0.0341	Sum squared residual	0.6824

Dependent Variable: dPt
Method: Least Squares
Included observations: 48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0209	0.0354	-0.5894	0.5585
D-dIBt	0.5668	0.1420	3.9925	0.0002

R-squared	0.2573	S.E. of regression	0.1556
Adjusted R-squared	0.2412	Sum squared residual	1.1130

Table 10: Prime Rate Changes' Sensitivities to Changes in CD Rate
The Netherlands, 1986 – 1998

Whole sample: 02/86 – 12/98 No. of observations : 95

dPt = Prime rate(t) - prime rate (t-1)

dCDt = Interbank rate(t) - interbank rate(t-1)
No. of zeros in dCDt: 5

D+dCDt = dCDt if dCDt > 0
= NA if dCDt < = 0

D-dCDt = NA if dCDt > 0
= dCDt if dCDt < = 0

Dependent Variable: dPt
Method: Least Squares
Included observations: 95 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	0.0076	0.0234	0.3232	0.7473
dCDt	0.5718	0.0635	9.0078	0.0000

R-squared	0.4659	S.E. of regression	0.2277
Adjusted R-squared	0.4602	Sum squared residual	4.8221

Dependent Variable: dPt
Method: Least Squares
Included observations: 45

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0157	0.0430	-0.3649	0.7170
D+dCDt	0.6192	0.1091	5.6731	0.0000

R-squared	0.4281	S.E. of regression	0.2107
Adjusted R-squared	0.4148	Sum squared residual	1.9085

Dependent Variable: dPt
Method: Least Squares
Included observations: 45

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	0.0427	0.0592	0.7213	0.4747
D-dCDt	0.6377	0.1636	3.8972	0.0003

R-squared	0.2610	S.E. of regression	0.2556
Adjusted R-squared	0.2438	Sum squared residual	2.8102

Table 11: Prime Rate Changes' Sensitivities to Changes in Interbank Lending Rate Germany, 1986 – 1998

Whole sample: 02/86 – 12/98 No. of observations : 155

dPt = Prime rate(t) - prime rate (t-1)

dIBt = Interbank rate(t) - interbank rate(t-1)
No. of zeros in dIBt: 15

D+dIBt = dIBt if dIBt > 0
= NA if dIBt <= 0

D-dIBt = NA if dIBt > 0
= dIBt if dIBt <= 0

Dependent Variable: dPt
Method: Least Squares
Included observations: 155 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0168	0.0205	-0.8193	0.4139
dIBt	0.2723	0.0761	3.5787	0.0005

R-squared	0.0772	S.E. of regression	0.2554
Adjusted R-squared	0.0712	Sum squared residual	9.9768

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1986:04 1998:11
Included observations: 65

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0614	0.0410	-1.4973	0.1393
D+dIBt	0.4637	0.1340	3.4610	0.0010

R-squared	0.1598	S.E. of regression	0.2500
Adjusted R-squared	0.1464	Sum squared residual	3.9389

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1986:02 1998:12
Included observations: 75

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0293	0.0461	-0.6358	0.5269
D-dIBt	0.1244	0.1755	0.7087	0.4808

R-squared	0.0068	S.E. of regression	0.2711
Adjusted R-squared	-0.0068	Sum squared residual	5.3648

Table 12: Prime Rate Changes' Sensitivities to Changes in Interbank Lending Rate Germany, 1986 – 1992

Sample period: 01/86 – 06/92 No. of observations : 77

dPt = Prime rate(t) - prime rate (t-1)

dIBt = Interbank rate(t) - interbank rate(t-1)
No. of zeros in dIBt: 7

D+dIBt = dIBt if dIBt > 0
= NA if dIBt <= 0

D-dIBt = NA if dIBt > 0
= dIBt if dIBt <= 0

Dependent Variable: dPt
Method: Least Squares
Included observations: 77 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	0.0364	0.0345	1.0553	0.2947
dIBt	0.1366	0.1060	1.2878	0.2018

R-squared	0.0216	S.E. of regression	0.2960
Adjusted R-squared	0.0086	Sum squared residual	6.5706

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1986:04 1992:06
Included observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0659	0.0577	-1.1423	0.2601
D+dIBt	0.4555	0.1546	2.9462	0.0053

R-squared	0.1783	S.E. of regression	0.2659
Adjusted R-squared	0.1578	Sum squared residual	2.8282

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1986:02 1992:05
Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	0.0077	0.0930	0.0826	0.9348
D-dIBt	-0.2606	0.3256	-0.8003	0.4308

R-squared	0.0240	S.E. of regression	0.3329
Adjusted R-squared	-0.0135	Sum squared residual	2.8821

Table 13: Prime Rate Changes' Sensitivities to Changes in Interbank Lending Rate Germany, 1992 – 1998

Sample period: 07/92 – 12/98 No. of observations : 78

dPt = Prime rate(t) - prime rate (t-1)

dIBt = Interbank rate(t) - interbank rate(t-1)
No. of zeros in dIBt: 8

D+dIBt = dIBt if dIBt > 0
= NA if dIBt <= 0

D-dIBt = NA if dIBt > 0
= dIBt if dIBt <= 0

Dependent Variable: dPt
Method: Least Squares
Included observations: 78

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0474	0.0192	-2.4760	0.0155
dIBt	0.4510	0.0913	4.9374	0.0000

R-squared	0.2429	S.E. of regression	0.1565
Adjusted R-squared	0.2329	Sum squared residual	1.8613

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1992:08 1998:11
Included observations: 23

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.1389	0.0861	-1.6127	0.1217
D+dIBt	1.4855	0.8293	1.7912	0.0877

R-squared	0.1325	S.E. of regression	0.2216
Adjusted R-squared	0.0912	Sum squared residual	1.0308

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1992:09 1998:12
Included observations: 47

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0316	0.0396	-0.7978	0.4292
D-dIBt	0.4966	0.1596	3.1106	0.0032

R-squared	0.1770	S.E. of regression	0.1839
Adjusted R-squared	0.1587	Sum squared residual	1.5218

Table 14: Prime Rate Changes' Sensitivities to Changes in CD Rate
Germany, 1986 – 1998

Whole sample: 02/86 – 12/98 No. of observations : 95

dPt = Prime rate(t) - prime rate (t-1)

dCDt = Interbank rate(t) - interbank rate(t-1)
No. of zeros in dCDt: 5

D+dCDt = dCDt if dCDt > 0
= NA if dCDt <= 0

D-dCDt = NA if dCDt > 0
= dCDt if dCDt <= 0

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1986:02 1993:12
Included observations: 95 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	0.0122	0.0276	0.4430	0.6588
dCDt	0.3966	0.0915	4.3349	0.0000

R-squared	0.1681	S.E. of regression	0.2692
Adjusted R-squared	0.1591	Sum squared residual	6.7395

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1986:03 1993:09
Included observations: 46

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0348	0.0687	-0.5075	0.6144
D+dCDt	0.6008	0.2206	2.7240	0.0092

R-squared	0.1443	S.E. of regression	0.2985
Adjusted R-squared	0.1249	Sum squared residual	3.9204

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1986:02 1993:12
Included observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0144	0.0641	-0.2246	0.8235
D-dCDt	0.2391	0.1975	1.2103	0.2337

R-squared	0.0371	S.E. of regression	0.2529
Adjusted R-squared	0.0118	Sum squared residual	2.4313

Table 15: Prime Rate Changes' Sensitivities to Changes in Interbank Lending Rate US, 1986 – 1998

Whole sample: 02/86 – 12/98 No. of observations : 155

dPt = Prime rate(t) - prime rate (t-1)

dIBt = Interbank rate(t) - interbank rate(t-1)
No. of zeros in dIBt: 13

D+dIBt = dIBt if dIBt > 0
= NA if dIBt <= 0

D-dIBt = NA if dIBt > 0
= dIBt if dIBt <= 0

Dependent Variable: dPt
Method: Least Squares
Included observations: 155 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0045	0.0170	-0.2629	0.7930
dIBt	0.3537	0.0567	6.2337	0.0000

R-squared	0.2025	S.E. of regression	0.2116
Adjusted R-squared	0.1973	Sum squared residual	6.8484

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1986:05 1998:11
Included observations: 65

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0335	0.0352	-0.9507	0.3454
D+dIBt	0.5050	0.1100	4.5905	0.0000

R-squared	0.2507	S.E. of regression	0.1939
Adjusted R-squared	0.2388	Sum squared residual	2.3677

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1986:02 1998:12
Included observations: 77

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0639	0.0397	-1.6099	0.1116
D-dIBt	0.1280	0.1289	0.9929	0.3240

R-squared	0.0130	S.E. of regression	0.2236
Adjusted R-squared	-0.0002	Sum squared residual	3.7506

Table 16: Prime Rate Changes' Sensitivities to Changes in Interbank Lending Rate US, 1986 – 1992

Sample period: 01/86 – 06/92 No. of observations : 77

dPt = Prime rate(t) - prime rate (t-1)

dIBt = Interbank rate(t) - interbank rate(t-1)
No. of zeros in dIBt: 7

D+dIBt = dIBt if dIBt > 0
= NA if dIBt <= 0

D-dIBt = NA if dIBt > 0
= dIBt if dIBt <= 0

Dependent Variable: dPt
Method: Least Squares
Included observations: 77 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0213	0.0296	-0.7194	0.4741
dIBt	0.3302	0.0779	4.2387	0.0001

R-squared	0.1933	S.E. of regression	0.2568
Adjusted R-squared	0.1825	Sum squared residual	4.9479

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1986:05 1992:03
Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0735	0.0604	-1.2186	0.2332
D+dIBt	0.5526	0.1489	3.7115	0.0009

R-squared	0.3297	S.E. of regression	0.2090
Adjusted R-squared	0.3058	Sum squared residual	1.2232

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1986:02 1992:06
Included observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.2175	0.0828	-2.6252	0.0124
D-dIBt	-0.1992	0.2111	-0.9438	0.3512

R-squared	0.0229	S.E. of regression	0.2647
Adjusted R-squared	-0.0028	Sum squared residual	2.6626

Table 17: Prime Rate Changes' Sensitivities to Changes in Interbank Lending Rate US, 1992 – 1998

Sample period: 07/92 – 12/98 No. of observations : 78

dPt = Prime rate(t) - prime rate (t-1)

dIBt = Interbank rate(t) - interbank rate(t-1)
No. of zeros in dIBt: 6

D+dIBt = dIBt if dIBt > 0
= NA if dIBt <= 0

D-dIBt = NA if dIBt > 0
= dIBt if dIBt <= 0

Dependent Variable: dPt
Method: Least Squares
Included observations: 78

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	0.0100	0.0177	0.5636	0.5747
dIBt	0.4143	0.0922	4.4918	0.0000

R-squared	0.2098	S.E. of regression	0.1559
Adjusted R-squared	0.1994	Sum squared residual	1.8471

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1992:08 1998:11
Included observations: 35

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0159	0.0462	-0.3442	0.7329
D+dIBt	0.5289	0.2077	2.5468	0.0157

R-squared	0.1643	S.E. of regression	0.1829
Adjusted R-squared	0.1389	Sum squared residual	1.1044

Dependent Variable: dPt
Method: Least Squares
Sample: 1992:07 1998:12
Included observations: 37

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	0.0158	0.0338	0.4659	0.6442
D-dIBt	0.3951	0.1924	2.0539	0.0475

R-squared	0.1076	S.E. of regression	0.1442
Adjusted R-squared	0.0821	Sum squared residual	0.7276

Table 18: Prime Rate Changes' Sensitivities to Changes in CD Rate
US, 1986 – 1998

Whole sample: 02/86 – 12/98 No. of observations : 95

dPt = Prime rate(t) - prime rate (t-1)

dCDt = Interbank rate(t) - interbank rate(t-1)
No. of zeros in dCDt: 4

D+dCDt = dCDt if dCDt > 0
= NA if dCDt <= 0

D-dCDt = NA if dCDt > 0
= dCDt if dCDt <= 0

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1986:02 1993:12
Included observations: 95 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0113	0.0202	-0.5583	0.5780
dCDt	0.5221	0.0604	8.6441	0.0000

R-squared	0.4455	S.E. of regression	0.1949
Adjusted R-squared	0.4395	Sum squared residual	3.5327

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1986:05 1993:11
Included observations: 41

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0988	0.0334	-2.9617	0.0052
D+dCDt	0.7701	0.1008	7.6423	0.0000

R-squared	0.5996	S.E. of regression	0.1422
Adjusted R-squared	0.5893	Sum squared residual	0.7886

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1986:02 1993:12
Included observations: 50

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	0.0222	0.0608	0.3641	0.7174
D-dCDt	0.5655	0.1736	3.2580	0.0021

R-squared	0.1811	S.E. of regression	0.2313
Adjusted R-squared	0.1640	Sum squared residual	2.5683

Table 19: Prime Rate Changes' Sensitivities to Changes in Interbank Lending Rate UK, 1986 – 1998

Whole sample: 02/86 – 12/98 No. of observations : 155

dPt = Prime rate(t) - prime rate (t-1)

dIBt = Interbank rate(t) - interbank rate(t-1)
No. of zeros in dIBt: 9

D+dIBt = dIBt if dIBt > 0
= NA if dIBt <= 0

D-dIBt = NA if dIBt > 0
= dIBt if dIBt <= 0

Dependent Variable: dPt
Method: Least Squares
Included observations: 155 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0106	0.0213	-0.4981	0.6191
dIBt	0.7667	0.0455	16.8510	0.0000

R-squared	0.6499	S.E. of regression	0.2643
Adjusted R-squared	0.6476	Sum squared residual	10.6860

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1986:07 1998:06
Included observations: 62

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0852	0.0404	-2.1063	0.0394
D+dIBt	0.8754	0.0788	11.1114	0.0000

R-squared	0.6730	S.E. of regression	0.2428
Adjusted R-squared	0.6675	Sum squared residual	3.5371

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1986:02 1998:12
Included observations: 84

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	0.0470	0.0437	1.0757	0.2852
D-dIBt	0.8419	0.0951	8.8483	0.0000

R-squared	0.4884	S.E. of regression	0.2829
Adjusted R-squared	0.4822	Sum squared residual	6.5620

Table 20: Prime Rate Changes' Sensitivities to Changes in Interbank Lending Rate UK, 1986 – 1992

Sample period: 01/86 – 06/92 No. of observations : 77

dPt = Prime rate(t) - prime rate (t-1)

dIBt = Interbank rate(t) - interbank rate(t-1)
No. of zeros in dIBt: 7

D+dIBt = dIBt if dIBt > 0
= NA if dIBt <= 0

D-dIBt = NA if dIBt > 0
= dIBt if dIBt <= 0

Dependent Variable: dPt
Method: Least Squares
Included observations: 77 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0044	0.0368	-0.1194	0.9053
dIBt	0.7860	0.0636	12.3628	0.0000

R-squared	0.6708	S.E. of regression	0.3223
Adjusted R-squared	0.6664	Sum squared residual	7.7913

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1986:07 1992:06
Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.1138	0.0909	-1.2511	0.2220
D+dIBt	0.9094	0.1254	7.2539	0.0000

R-squared	0.6693	S.E. of regression	0.3370
Adjusted R-squared	0.6566	Sum squared residual	2.9528

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1986:02 1992:05
Included observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	0.0872	0.0843	1.0340	0.3074
D-dIBt	0.9079	0.1643	5.5263	0.0000

R-squared	0.4329	S.E. of regression	0.3276
Adjusted R-squared	0.4188	Sum squared residual	4.2934

Table 21: Prime Rate Changes' Sensitivities to Changes in Interbank Lending Rate UK, 1992 – 1998

Sample period: 07/92 – 12/98 No. of observations : 78

dPt = Prime rate(t) - prime rate (t-1)

dIBt = Interbank rate(t) - interbank rate(t-1)
No. of zeros in dIBt: 2

D+dIBt = dIBt if dIBt > 0
= NA if dIBt <= 0

D-dIBt = NA if dIBt > 0
= dIBt if dIBt <= 0

Dependent Variable: dPt
Method: Least Squares
Included observations: 78

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0192	0.0222	-0.8660	0.3892
dIBt	0.7042	0.0683	10.3064	0.0000

R-squared	0.5829	S.E. of regression	0.1936
Adjusted R-squared	0.5774	Sum squared residual	2.8490

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1992:07 1998:06
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0267	0.0392	-0.6827	0.4997
D+dIBt	0.6000	0.1802	3.3294	0.0022

R-squared	0.2573	S.E. of regression	0.1288
Adjusted R-squared	0.2341	Sum squared residual	0.5311

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1992:09 1998:12
Included observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	0.0244	0.0455	0.5366	0.5945
D-dIBt	0.8023	0.1147	6.9949	0.0000

R-squared	0.5502	S.E. of regression	0.2361
Adjusted R-squared	0.5390	Sum squared residual	2.2302

Table 22: Prime Rate Changes' Sensitivities to Changes in CD Rate
UK, 1986 – 1998

Whole sample: 02/86 – 12/98 No. of observations : 95

dPt = Prime rate(t) - prime rate (t-1)

dCDt = Interbank rate(t) - interbank rate(t-1)
No. of zeros in dCDt: 15

D+dCDt = dCDt if dCDt > 0
= NA if dCDt <= 0

D-dCDt = NA if dCDt > 0
= dCDt if dCDt <= 0

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1986:02 1993:12
Included observations: 95 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0052	0.0270	-0.1924	0.8479
dCDt	0.8311	0.0469	17.7119	0.0000

R-squared	0.7713	S.E. of regression	0.2600
Adjusted R-squared	0.7689	Sum squared residual	6.2846

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1986:07 1993:12
Included observations: 36

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.1255	0.0546	-2.3007	0.0277
D+dCDt	0.9903	0.0882	11.2309	0.0000

R-squared	0.7877	S.E. of regression	0.2464
Adjusted R-squared	0.7814	Sum squared residual	2.0643

Dependent Variable: dPt
Method: Least Squares
Sample(adjusted): 1986:02 1993:11
Included observations: 54

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	0.0512	0.0540	0.9480	0.3475
D-dCDt	0.8788	0.0947	9.2797	0.0000

R-squared	0.6235	S.E. of regression	0.2711
Adjusted R-squared	0.6163	Sum squared residual	3.8208

Table 23: Sensitivity of Prime Rate Changes to Interbank Lending Rate - Lagged Regressions
The Netherlands

Dependent Variable: dPt
Method: Least Squares
Date: 02/01/01 Time: 13:35
Sample(adjusted): 1986:05 1998:12
Included observations: 152 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0122	0.0477	-0.2571	0.7975
dPt-1	-0.1374	0.0809	-1.6982	0.0916
dPt-2	-0.1472	0.0756	-1.9479	0.0534
dPt-3	0.0883	0.0638	1.3833	0.1687
IBt	0.0022	0.0076	0.2889	0.7730
dIBt	0.4947	0.0650	7.6064	0.0000
dIBt-1	0.3550	0.0753	4.7133	0.0000
dIBt-2	0.2153	0.0814	2.6432	0.0091

R-squared	0.4382	Mean dependent var	-0.0130
Adjusted R-squared	0.4109	S.D. dependent var	0.2624
S.E. of regression	0.2014	Akaike info criterion	-0.3159
Sum squared resid	5.8404	Schwarz criterion	-0.1568
Log likelihood	32.0120	Durbin-Watson stat	2.0388

Dependent Variable: dPt
Method: Least Squares
Date: 02/01/01 Time: 13:37
Sample(adjusted): 1986:05 1993:12
Included observations: 92 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	0.0202	0.0861	0.2350	0.8148
dPt-1	-0.2040	0.0996	-2.0479	0.0437
dPt-2	-0.2276	0.0944	-2.4113	0.0181
dPt-3	0.0756	0.0699	1.0818	0.2824
CDt	-0.0014	0.0117	-0.1177	0.9066
dCDt	0.5599	0.0578	9.6802	0.0000
dCDt-1	0.2904	0.0790	3.6764	0.0004
dCDt-2	0.3009	0.0818	3.6795	0.0004

R-squared	0.6071	Mean dependent var	0.0085
Adjusted R-squared	0.5743	S.D. dependent var	0.3097
S.E. of regression	0.2020	Akaike info criterion	-0.2770
Sum squared residual	3.4290	Schwarz criterion	-0.0585
Log likelihood	20.7762	Durbin-Watson stat	2.0200

Table 24: Sensitivity of Prime Rate Changes to Interbank Lending Rate - Lagged Regressions
Germany

Dependent Variable: dPt
Method: Least Squares
Date: 02/01/01 Time: 13:43
Sample(adjusted): 1986:05 1998:12
Included observations: 152 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0790	0.0551	-1.4340	0.1537
dPt-1	-0.0876	0.0821	-1.0673	0.2876
dPt-2	0.1604	0.0763	2.1023	0.0373
dPt-3	0.0377	0.0756	0.4989	0.6186
IBt	0.0119	0.0088	1.3517	0.1786
dIBt	0.2261	0.0715	3.1630	0.0019
dIBt-1	0.2970	0.0744	3.9921	0.0001
dIBt-2	0.1025	0.0784	1.3071	0.1933

R-squared	0.2430	Mean dependent var	-0.0164
Adjusted R-squared	0.2061	S.D. dependent var	0.2647
S.E. of regression	0.2358	Akaike info criterion	-0.0002
Sum squared resid	8.0087	Schwarz criterion	0.1589
Log likelihood	8.0157	Durbin-Watson stat	2.0088

Dependent Variable: dPt
Method: Least Squares
Date: 02/02/01 Time: 13:57
Sample(adjusted): 1986:05 1993:12
Included observations: 92 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0635	0.0921	-0.6892	0.4926
dPt-1	-0.1292	0.1061	-1.2180	0.2266
dPt-2	0.1683	0.0998	1.6858	0.0955
dPt-3	0.0737	0.0940	0.7836	0.4355
CDt	0.0112	0.0142	0.7922	0.4305
dCDt	0.3707	0.0882	4.2047	0.0001
dCDt-1	0.2994	0.0970	3.0865	0.0027
dCDt-2	0.1063	0.1013	1.0496	0.2969

R-squared	0.3158	Mean dependent var	0.0217
Adjusted R-squared	0.2588	S.D. dependent var	0.2934
S.E. of regression	0.2526	Akaike info criterion	0.1686
Sum squared resid	5.3580	Schwarz criterion	0.3879
Log likelihood	0.2449	Durbin-Watson stat	2.0376

Table 25: Sensitivity of Prime Rate Changes to Interbank Lending Rate - Lagged Regressions
UK

Dependent Variable: dPt
Method: Least Squares
Date: 02/01/01 Time: 13:49
Sample(adjusted): 1986:05 1998:12
Included observations: 152 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0130	0.0507	-0.2571	0.7975
dPt-1	-0.4493	0.0760	-5.9081	0.0000
dPt-2	-0.1224	0.0675	-1.8130	0.0719
dPt-3	0.0338	0.0385	0.8770	0.3820
IBt	0.0008	0.0052	0.1468	0.8835
dIBt	0.7438	0.0362	20.5593	0.0000
dIBt-1	0.4878	0.0659	7.3984	0.0000
dIBt-2	0.2945	0.0681	4.3256	0.0000

R-squared	0.7953	Mean dependent var	-0.0313
Adjusted R-squared	0.7853	S.D. dependent var	0.4202
S.E. of regression	0.1947	Akaike info criterion	-0.3836
Sum squared resid	5.4582	Schwarz criterion	-0.2245
Log likelihood	37.1552	Durbin-Watson stat	2.0901

Dependent Variable: dPt
Method: Least Squares
Date: 02/01/01 Time: 13:50
Sample(adjusted): 1986:05 1993:12
Included observations: 92 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	0.0356	0.0854	0.4169	0.6778
dPt-1	-0.4589	0.0979	-4.6868	0.0000
dPt-2	-0.1480	0.0916	-1.6160	0.1099
dPt-3	0.0459	0.0398	1.1525	0.2524
CDt	-0.0033	0.0076	-0.4414	0.6600
dCDt	0.8076	0.0381	21.2049	0.0000
dCDt-1	0.5166	0.0890	5.8076	0.0000
dCDt-2	0.2434	0.0919	2.6494	0.0096

R-squared	0.8715	Mean dependent var	-0.0543
Adjusted R-squared	0.8608	S.D. dependent var	0.5106
S.E. of regression	0.1905	Akaike info criterion	-0.3951
Sum squared resid	3.0492	Schwarz criterion	-0.1758
Log likelihood	26.1752	Durbin-Watson stat	2.1448

Table 26: Sensitivity of Prime Rate Changes to Interbank Lending Rate - Lagged Regressions
US

Dependent Variable: dPt
Method: Least Squares
Date: 02/01/01 Time: 13:55
Sample(adjusted): 1986:05 1998:12
Included observations: 152 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0213	0.0496	-0.4301	0.6678
dPt-1	-0.3066	0.0771	-3.9764	0.0001
dPt-2	-0.0494	0.0646	-0.7655	0.4452
dPt-3	0.1616	0.0592	2.7285	0.0072
IBt	0.0047	0.0078	0.6028	0.5476
dIBt	0.2873	0.0452	6.3559	0.0000
dIBt-1	0.4727	0.0507	9.3257	0.0000
dIBt-2	0.2382	0.0585	4.0698	0.0001

R-squared	0.5339	Mean dependent var	-0.0049
Adjusted R-squared	0.5112	S.D. dependent var	0.2317
S.E. of regression	0.1620	Akaike info criterion	-0.7517
Sum squared resid	3.7773	Schwarz criterion	-0.5926
Log likelihood	65.1314	Durbin-Watson stat	2.2268

Dependent Variable: dPt
Method: Least Squares
Date: 02/01/01 Time: 13:54
Sample(adjusted): 1986:05 1993:12
Included observations: 92 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
One	-0.0376	0.0611	-0.6150	0.5402
dPt-1	-0.3276	0.1066	-3.0725	0.0029
dPt-2	0.0354	0.0945	0.3745	0.7090
dPt-3	0.0321	0.0719	0.4463	0.6565
CDt	0.0067	0.0090	0.7402	0.4613
dCDt	0.4631	0.0557	8.3143	0.0000
dCDt-1	0.3898	0.0735	5.3049	0.0000
dCDt-2	0.1400	0.0809	1.7301	0.0873

R-squared	0.6021	Mean dependent var	0.0272
Adjusted R-squared	0.5689	S.D. dependent var	0.2553
S.E. of regression	0.1676	Akaike info criterion	-0.6511
Sum squared resid	2.3605	Schwarz criterion	-0.4319
Log likelihood	37.9524	Durbin-Watson stat	2.0723

Figure 1: The Netherlands

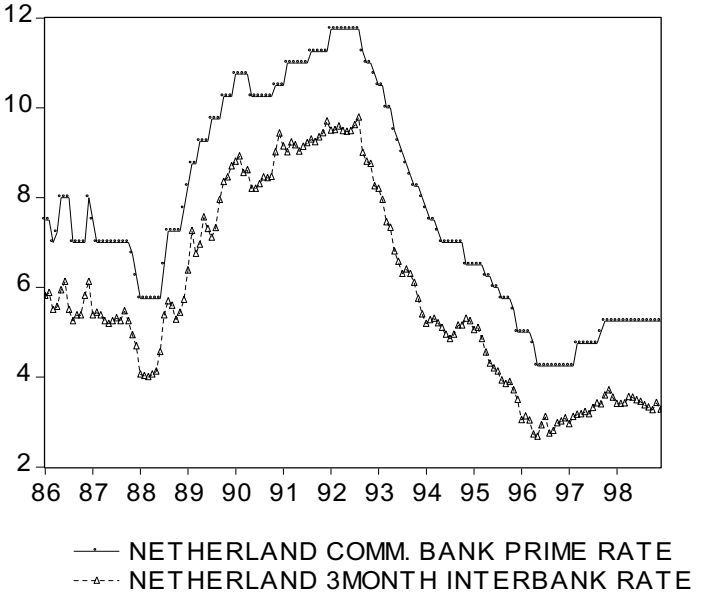


Figure 2: Germany

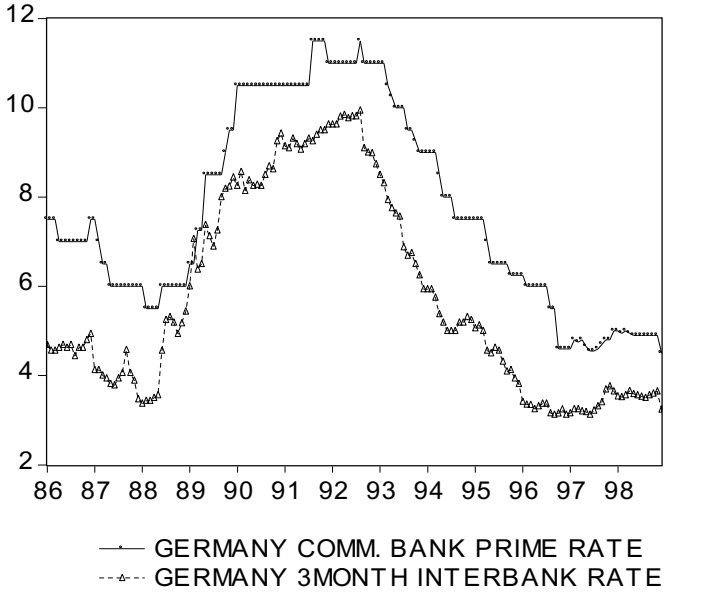


Figure 3: UK

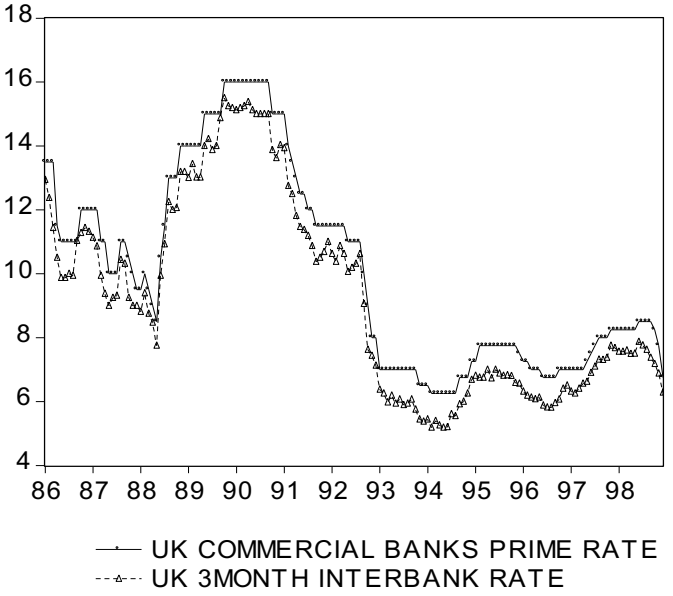
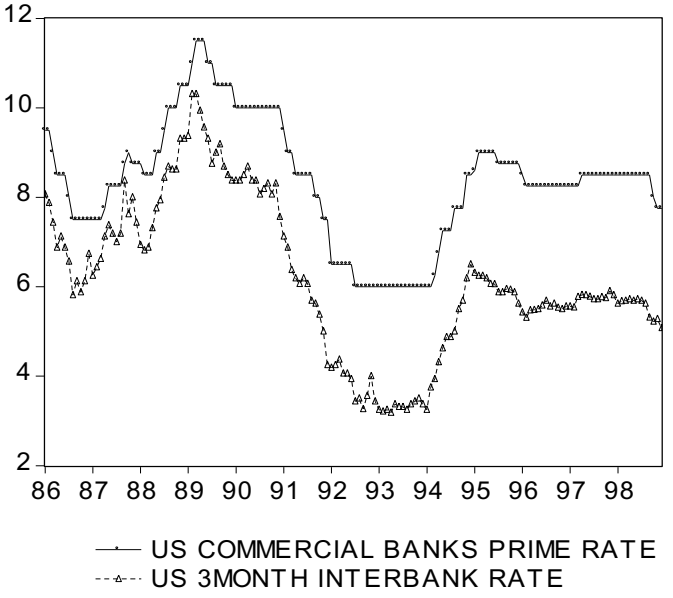


Figure 4: US



4 Loan Pricing, Collateral and Covenants: The Dutch and Other Countries' Experience

4.1 Introduction

In Chapter 3, we focused on the 'pricing' of bank loans and analyzed the determination of the bank prime lending rates in the Netherlands, Germany, the US and the UK. The prime rate is the lending rate on which banks base the interest rate they charge on loans to borrowers, and which compensates banks for their underlying funding costs and intermediation services (through the bank spread or intermediation spread). In addition, banks charge borrowers a mark-up depending on their default risk (i.e., the credit risk premium or credit spread).

The cost of borrowing for firms, however, is a multi-faceted concept. In addition to the prime lending rate and the credit spread, it also reflects more implicit factors, such as: (*i*) (usage) fees on loans, (*ii*) collateral or security requirements, (*iii*) (restrictive) loan covenants that constrain a borrower's actions after a loan is made, and (*iv*) loan maturity. Moreover, the availability of credit is important. This is particularly the case for smaller and medium-size firms, for which access to alternative funding sources generally is limited.

In this chapter, we compare the cost and availability features of borrowing in the Netherlands with those of the UK, the US and Germany, drawing where possible on empirical evidence. We examine the determination of the credit spreads in the four countries, as well as the importance of collateral, loan covenants and loan maturity, and the availability of credit to smaller firms. Observe that an international comparison of the contractual features of bank loans is most interesting at the 'micro-level' of individual firms and contracts. However, since such detailed information is not available for any of the countries, we focus on a more general discussion of the contractual mechanisms in the four countries. For the UK, the US and Germany, we will draw on insights from the empirical banking literature, which is partly based on small business surveys. Since such information is not available for the Netherlands, we obtained evidence from interviews with several bank loan officers, and a limited number of Dutch studies.

Our main objective in this chapter is to document the stylized facts and institutions in the credit markets in the different countries. For each of the countries, we will therefore describe the (competitive) structure of the overall loan market, and also discuss the importance of bankruptcy laws and other aspects of the competitive and regulatory environment that may have an impact on the contractual design of bank loans.

The organization of this chapter is as follows. In Section 4.2 we will give an overview of the Dutch loan market, and discuss evidence on the contractual design and availability of bank loans to smaller and medium-size firms in the Netherlands. Section 4.3 focuses on the bank loan market in the UK. Section 4.4 discusses empirical evidence for the US market. Section 4.5 describes the cost and availability features of credit in the German loan market. Finally, Section 4.6 concludes.

4.2 The Cost and Availability of Credit in the Dutch Loan Market

In contrast to the UK, the US and Germany, information on the functioning of the Dutch loan market, and in particular the market segment of smaller and medium-size firms, has not been documented extensively. As a consequence, little is known regarding the contractual terms of Dutch bank loans, and how they compare internationally. In order to develop a better understanding of the Dutch credit market, we therefore conducted a series of interviews with loan officers and account managers of the major Dutch banks in March 2001. In this section, we report the results of these interviews and link them to the (limited) existing empirical evidence for the Netherlands. We start with a brief description of the supply side of the Dutch loan market, and then move on to a discussion of the credit spread and the relevance of collateral and covenants. We will conclude with a discussion of the credit availability to smaller and medium-size firms in the Netherlands.

4.2.1 Overall Market

The Dutch loan market is dominated by four banks: ABN AMRO, ING, Rabobank and Fortis. Foreign competition in this market is limited, except for the presence of Deutsche Bank, which has made a real attempt to penetrate the mid-cap domestic market, and banks like BNP, Citibank and Chase, that are involved with the very largest Dutch corporations and/or with firms that have a trading relationship with the respective banks' home country. Because of the relatively limited number of banks in the Dutch credit market, and the fact that each offers a universal range of services, most small and medium-size firms choose one bank as their 'main' or relationship bank, although the very largest companies tend to have relationships with all four Dutch banks, as well as with a number of foreign banks (see also Ongena and Smith, 2000). Indeed, while some smaller customers might prefer to purchase different services from different banks, the all-encompassing relationship nature and universal (or 'all finanz') nature of Dutch banking tends to prevent them from doing so. According to the Bureau Bartels Report (1999), which analyzed the market for credit for small and medium-size firms in the Netherlands in 1999, based on a total sample of 492 small and medium-size firms, only 25% of the firms turned down for credit by their current relationship bank approached another bank to obtain financing, and only 20% of all firms needing external financing shopped around for loans and compared financing terms offered by different banks. This report also shows that, overall, about 12 ½% of all the firms that applied for a loan eventually could not obtain bank credit from either their relationship bank or a competitor. Moreover, less than 10% of the small and medium-size firms in the sample considered alternative external financing sources.

In general, the four large Dutch banks classify their business customers into three groups: (*i*) small firms, (*ii*) medium-sized or 'mid-cap' firms, and (*iii*) large/global firms. The 'breakpoints' between these categories seem to be somewhat 'grey' and vary across banks. For example, one bank defines small by number of employees, while another uses number of employees and sales turnover (with a small firm defined as a firm with less

than 20 employees and with sales revenues less than 20 million guilders). Yet another bank defines small by the size of the firm's annual credit needs.[1] Medium-sized companies can range all the way up from those with more than 20 employees to the many thousands, and turnover from 2 million guilders to 1 billion guilders or more. However, in general medium-sized companies are oriented towards domestic product or service markets, whereas the largest companies (such as Shell, Philips, Unilever, etc.) are globally oriented ('internationals'). Apart from their global orientation, larger companies are more likely to be rated by bond rating agencies (e.g., by S&P and Moody's), and generally have access to other sources of private debt and to domestic and international public bond and stock markets.

4.2.2 Loan Pricing

In recent years, the pricing of bank loans to Dutch non-financial firms has become increasingly formulaic (irrespective of the loan amount extended), and thus less subject to account officer discretion (although loan officer/committee discretion has not completely disappeared). All four banks in the Netherlands either have recently implemented or are in the process of implementing RAROC (risk-adjusted return on capital) systems and/or rating systems for borrowers. This development seems to have been driven in part by the perception that domestic and international loan markets have become more competitive, while at the same time shareholder value has become more important.

A RAROC system calculates the ratio of the net return on a loan extended by a bank (defined as the fees received on the loan plus a spread minus operating costs minus expected loan losses) relative to the loan's risk or the economic capital that needs to be allocated to the loan in order to protect the bank against unexpected losses on the loan (see Saunders, 1999). In some cases, the regulatory required capital on the loan (i.e., the BIS 8% risk-based capital requirement) is used in the denominator of the RAROC equation instead of the economic capital.[2] The calculated RAROC has to be larger than a cost of equity capital (ROE) benchmark for the loan to be granted. Essentially, if the loan's RAROC exceeds the bank's cost of equity, then value will be 'created' for the shareholders of the bank if the loan is granted; if it is negative, then shareholder value will be destroyed. As a result, the loan rates (and fees) on individual loans must be sufficiently large relatively to the 'capital at risk' to justify a positive outcome for a loan application. In the Dutch system, some banks use an ROE net of taxes, while others use a gross ROE. Currently, the ROE benchmark appears to lie in the 12% to 15% range, depending on whether it is a net or gross measure.[3]

In determining the loan rate to fit into the RAROC model, as well as the (firm-specific) risk that ultimately will be incorporated in the credit spread, all four Dutch banks have developed loan risk-rating systems. The number of risk-ratings varies from 7 to as many as 20. The worst 2 or 3 ratings usually reflect problem loans or loans close to

1 According to the Bureau Bartels Research Report (1999) few of the small and medium-sized firms in their sample had individual loan needs exceeding 250,000 guilders.

2 In this case the RAROC system is really a 'RORAC' system (i.e., return on risk adjusted capital), where risk is defined by the regulatory minimum solvency ratio (see Saunders, 1999).

3 For the Rabobank, defining the appropriate benchmark has proved difficult because of its cooperative status.

default. One major impetus for the recent implementation of internal risk-ratings on loans made by the large Dutch banks has been the proposed reform to the 8% risk capital requirements for credit risk under the BIS capital standards regime introduced in 1992. Under the most recent proposal (January 2001), those banks with internal rating-based systems in place may be allowed to use their internal risk-rating systems (along with a pre-specified formula that links ratings with default probabilities) to calculate their required regulatory capital. Those banks without internal risk-rating systems, on the other hand, will have to use a standardized model in which loans to borrowers that are rated by S&P or Moody's (or an equivalent domestic bond rating agency) will have capital requirements that vary between 1.6% and 12% of a loan's face value, while loans to borrowers that are not rated by a bond rating agency are subject to an 8% capital ratio (the same as under the current system). Under the proposed internal rating-based scheme, the bank's capital requirements will reflect a continuous function that can result in capital charges lower than 1% and charges as high as 50%.[4] Depending on the credit quality of their borrower pool, banks thus may have increased incentives to reduce the supply of credit to lower quality credit risks (i.e., lower rated firms) and/or to increase the required interest rates and fees to compensate them for the potentially higher capital charges when the proposed reform comes fully into effect (in 2005). To the extent that unsecured loans are made, the proposed BIS reforms can furthermore increase any inherent bank bias against unsecured or under-collateralized loans. Indeed, under the proposed (2001) internal rating based models, the degree of security backing (secured versus unsecured) is explicitly part of the formula. That is, unsecured loans have a higher risk weight, because of their higher expected loss given default. Since the internal rating based (IRB) models reflect collateral risk implicitly in calculating the probability of default (via the credit risk weighting), and thus the benchmark risk rate, as well as the loss given default (via the degree of explicit security backing), and since the total risk weight is a product of the probability of default and the loss given default (LGD), uncollateralized loans are likely to become extremely expensive to make if the Basle (2001) reforms go through.

In fitting a borrower into a rating class, a variety of criteria and models are used. For the smallest borrowers, solvency and cash flow ratios are usually analyzed, and in some cases fitted into a formal credit-scoring model. Interestingly, a recent survey by the Central Bank found that payback capacity (risk weight 50%) and solvency (risk weight 30%) were more important than collateral in banks' own internal rating schemes (risk weight 20%). In other cases, a fixed weighting of various solvency and other risk factors is used. In some cases, collateral is an explicit variable in the ratings classification, whereas in others posting collateral results in a ratings upgrade (say from 4 to 5) or leads to a lower interest rate (say an interest rate reduction of ½% relative to an unsecured loan). The purpose of the risk rating system – other than for capital allocation – is to determine a minimum (credit) spread or margin to be added to the base rate of the loan.

4 For example, if the one-year probability of default on a loan to a borrower in a low rating class is 20%, then its capital charge would be 50% under the proposed internal rating-based scheme.

In the case of floating rate loans (so called current account loans) the rating and the size of the loan are usually entered into a pricing matrix to determine the minimum margin or spread. Thus, a low-rated small firm borrowing less than 100,000 guilders might pay a minimum spread of 3.95% over the base rate, while a medium-sized company borrowing 5 million guilders might pay 20 basis points less (i.e., 3.75%). For fixed rate (or term) loans, the matrix to determine the minimum spread often has an extra dimension reflecting the loan's maturity (and in some cases, for loans for which the interest rate can be reset periodically, the period during which the loan rate is fixed). While the rating of the borrower may determine a minimum spread or interest rate, different banks allow account managers and loan committees varying degrees of discretion to adjust the credit spread around this 'minimum'.

The base rates for both current account loans and term loans in the Netherlands reflect the underlying interbank Euribor rate plus a banker's 'mark-up' (i.e., the bank or intermediation spread). For current account (floating rate) loans, the base rate may reflect a short-term rate like 1-month or 3-month Euribor. For term loans, the base rate will reflect the underlying maturity of the loans and is matched with a longer-term Euribor rate. The mark-up over Euribor varies, but has recently been in the ½% to ¾% range (see also Chapter 3 of this study, which analyzes bank base (prime) lending rates and bank spreads in different countries).

In addition to the base rate, the mark-up and the credit spread (which varies with a borrower's risk rating, loan size and the period of loan rate fixity), many banks charge 'add-on' fees. Small and medium-sized borrowers in the Netherlands are most likely to be exposed to these additional fees, because of their single bank relationships and lack of access to capital markets. Observe that in order to have access to the bond market, a borrower generally needs a bond rating, and fewer than 100 Dutch companies have such ratings (in fact, it is estimated that only 1,000 companies in Europe currently have such ratings). In many cases, a fee is charged on the origination of a loan (often as high as 1% of the loan amount), and an additional fee is charged in the case of floating rate (or current account) loans that involve the usage of a credit line. For example, a borrower may be charged between ¼% and ½% of the maximum amount to be drawn on the credit line during given period. In some cases, banks also charge a fee on the unused portion of the credit line, (i.e., a 'non-usage' fee). Currently, however, there appears to be a trend towards reducing the size of the usage fee on all but the smallest borrowers.

4.2.3 Collateral

Loan collateral or security appears to be of great importance in lending to small and medium-sized firms in the Netherlands. Indeed, many smaller borrowers consider banks to be excessively risk averse in imposing what they perceive to be high collateral requirements. This is especially the case, since – given the banks' increased emphasis on credit-scoring, credit-rating and RAROC systems – the small and medium-sized borrowers in the interviews felt that they already compensated the banks for credit risk through the

payment of loan spreads and other fees.[5] That is, borrowers appear to feel that there is an element of 'double counting' in the bank's required compensation for bearing risk, in that risk is reflected in both the price and the collateral terms of the loan. Moreover, many new technology firms have difficulty in borrowing at all, because the nature of their business involves little physical collateral, such as buildings and equipment and/or storable goods. These firms suffer additionally because their cash flow projections are generally uncertain. The financing problems for new technology firms are likely to intensify if the current downturn in new industry/technology firms' prospects continues (see also the Bureau Bartels Report, 1999).

In the absence of sufficient collateral, a borrower is either turned down or, if small enough (and the bank views the Dutch government's (collateral) guarantee as being sufficient to fill the collateral or equity 'gap' for this borrower) utilizes the government's BMKB loan guarantee program. The BMKB loan guarantee program provides a government (collateral) guarantee for up to 50% of the loan amount, in return for which the borrower has to pay an upfront fee of 3% to the government. For the largest banks, about 3% of their small business loans are guaranteed in this fashion.

One reason given by bankers for conservatism regarding collateral requirements is the way that bankruptcy law – and in particular bankruptcy priority rules – operate in practice in the Netherlands.[6] A commonly heard argument is that, unless the bank makes its rights to collateral very clear upfront (and at an early stage), its claims may be overridden by the Dutch tax authorities and/or other suppliers (creditors) to the bankrupt firm. For example, a bank's first lien on accounts receivable may be weakened if a supplier can show that he/she provided invoiced goods to the bankrupt firm that have yet to be paid for. Such a problem is most likely to arise if additional collateral demands are made by the bank close to the time of bankruptcy. The latter might be the case if a loan is only partly collateralized initially, or not collateralized at all. In a number of bankers' views, it is this uncertainty about priority rights to collateral (such as accounts receivable), created at or around the time of bankruptcy, which makes them relatively risk averse in specifying collateral demands at the time at which loans are originated. For example, Dutch courts (receivers) may well dispute banks' claims for collateral that originated as long as 6 months to one year before bankruptcy materialized.

However, the uncertainty regarding the bank's ultimate priority in the case of bankruptcy may also have a positive impact on loan availability, in that Dutch banks will try to work with the firm (i.e., assist in a reorganization of the firm, a sale of the firm, etc.) so as to avoid formal bankruptcy proceedings. That is, a bankruptcy filing appears to be a last resort. Indeed, the absence of harsh 'lender liability' laws in the Netherlands may enhance Dutch banks' willingness to continue lending to weakly rated firms (even at a higher interest rate), rather than forcing the firm into liquidation. In countries like the

5 As noted earlier, banks argue that collateral plays a smaller part in pricing and supply than firms argue (e.g. bank risk weighting systems give collateral an approximately 20% weight as compared to payback capacity (50%) and solvency (30%)). Observe that, should the proposed 2001 BIS Reforms come into effect for capital standards, then the bias against unsecured loans is likely to be enhanced, because of the higher risk weight of such loans under the internal ratings based (IRB) models.

6 For a detailed overview of the economic impact of the Dutch bankruptcy law, see Boot and Ligterink (2000).

US and France, on the other hand, where lender liability laws are strong, banks are less willing to get actively involved in providing new financing to very weak firms for fear that, if bankruptcy actually occurs, they will be sued by other creditors arguing that the bank was acting as a 'quasi-equity' holder in the failed firm and thus is liable for its remaining debts (see James, 1996). That is, the degree of strength of lender liability laws appears to dictate the willingness of banks to restructure debt and take an active role in firm reorganization prior to bankruptcy.

4.2.4 Loan Covenants

For larger firms (i.e., larger mid-cap and global firms) in the Netherlands, collateral requirements in bank loans are normally replaced by covenants. Like bond covenants, such covenants may be restrictive, and refer to actions the firm should (or should not) take. Common covenants in the Netherlands relate to debt seniority, and to working capital and liquidity ratios that need to be maintained. There appears to be a feeling among some larger borrowers that these covenants are often overly restrictive, and in particular are more restrictive than those found in overseas bond or bank loan markets. However, as noted by Berger and Udell (1995), among others, relatively harsh covenants are consistent with increased availability of loans.

4.2.5 Credit Availability

The *Tables 1* through *5* incorporate information with respect to the lending activities of the four large Dutch banks, derived from recent Annual Reports and Financial Statements. As can be seen below, in most cases the amount of small and medium-sized enterprise lending (sometimes called SME loans) in the banks' total lending activities is not separately reported. Little direct information on small business lending can therefore be generated from an analysis of these aggregate financial statements. This difficulty is enhanced because the financial statements of these institutions are often consolidated, and include the international and non-banking ('all finanz') activities of the group, in particular insurance activities.

Table 1 and *Table* 2 present relevant annual data for the Rabobank Group (consolidated financial statements, which include the local Rabobanks) and Rabobank Nederland (the umbrella organization) for the years 1998 and 1999. By the end of 1999, out of a total amount of worldwide private sector lending by the Rabobank Group of 160.6 billion Euros, an amount of 109.4 billion Euros was granted by the local (domestic) Rabobanks, 39.1 billion was granted by Rabobank international and 12.1 billion by other units (this is out of a total of worldwide assets of 281 billion Euros). Rabobank Group estimates that it has a 38% share of the domestic market for SME loans and an 87% share of the market for agricultural loans (see *Table 1*). One interesting feature of Rabobank Nederland's lending operations vis-à-vis the consolidated lending activities of the Rabobank Group is the maturity structure of the loans outstanding. A comparison of *Table 1* and *Table 2* indicates that the maturity of loans extended by Rabobank Nederland is quite short (less than one year for the majority of loans), whereas the majority of loans made by the consoli-

dated group (including all local banks) has a maturity of over five years. Note, that many of Rabo's domestic borrowers are very small firms. Finally, the absence of subordinated lending is very clear: subordinated loans and advances accounted for only 58 million Euros in 1999, out of a total loan portfolio of 170 billion Euros.

Table 3 presents the consolidated balance sheet of ING for the years 1998 and 1999. As can be seen from the table, the size of ING's domestic loan portfolio is approximately equal to the size of its international loan portfolio. More specifically, out of a total loan portfolio of 201.8 billion Euros in 1999, domestic loans accounted for 102.2 billion Euros (approximately 50%). The table also highlights the importance of mortgage collateral for ING. In 1999 a loan amount of 58 billion Euros (around 55% of the total amount of domestic loans) was secured by mortgages. Subordinated loans for ING are insignificant (and equal about 0.2% of total lending). ING's annual report does not break down the maturity structures of international versus domestic loans. However, *Table 3* shows that, on a consolidated basis, approximately 42% of ING's loans have maturities of less than one year as compared to Rabobank Group's 30%. Finally, and related to this, ING appears to be strong in lending to the services sector.

Table 4 captures the consolidated balance sheet for Fortis for the year 1999. Like ING, Fortis has a considerable amount of insurance and international activities. *Table 4* shows that in 1999 the total loans to total assets ratio for Fortis equaled 54%, and thus was higher than ING's (which equaled 41%, see *Table 3*). Contrary to the other three Dutch banks, Fortis explicitly reports its SME loans. In 1999, Fortis's SME loans amounted to 30.4 billion Euro out of a total loan portfolio of 221.3 billion Euros (SME lending thus represents approximately 14% of total group lending). Like ING, Fortis predominantly provides loans to the services industries. No information is available in the consolidated financial statements regarding the maturity breakdown of Fortis's loan portfolio.

Table 5 finally presents comparative lending information for the ABN AMRO Group for the years 1998 and 1999. Out of a total loan portfolio of 259 billion Euros in 1999, the amount of domestic loans to the private sector equaled 88.6 billion Euros. Given ABN AMRO's total group assets of 457.9 billion Euros in 1999, domestic private sector loans account for approximately 19% of total bank assets, and the total loan to total assets ratio is approximately 57%. In terms of collateral, the ABN AMRO annual report provides a breakdown of the collateral backing for the bank's commercial and retail loans (commercial loans account for approximately 50% of the total loan portfolio, while retail loans account for approximately 30%). As can be seen from *Table 5*, mortgages play a far more important collateralizing role for retail loans than for commercial loans (61% of retail loans is collateralized by mortgages, versus 7% of commercial loans), whereas other collateral (most likely equipment) appears to be the most important type of collateral for commercial loans. No information is available in the financial statements regarding the maturity structure of domestic loans, or the proportion of total loans made to domestic small and medium-sized business.

Overall, it is hard to draw definitive conclusions regarding small business lending in the Netherlands from an analysis of the large four Dutch banks' (consolidated) financial

statements. Nevertheless, the following 'stylized facts' can be drawn. First, all four banks are highly global, with domestic lending (where figures are available) comprising less than 50% of total bank lending (except for Rabobank), and with bank lending itself comprising between 40% and 60% of total group asset portfolios. Thus, total domestic bank lending (measured as a proportion of the book value of total assets) appears to vary between 20% and 40% of total group assets. Second, where figures regarding SME lending are available (see *Table 4* for Fortis), small business lending appears to comprise around 14% of total loans. Using a 50% domestic-international loan ratio, this suggests that SME loans might account for approximately 28% to 30% of banks' domestic loan portfolios. Third, the importance of loan seniority, collateral and loan maturity as risk control devices appears also evident from these data. Where reported (i.e., for Rabobank and ING), subordinated lending constitutes less than 10 basis points of total bank assets. With respect to collateral, a large majority of domestic loans are secured, predominantly by mortgages and inventory. Finally, the BIS capital ratios of all 4 major banks are well above the minimum 8% ratio (in 1999, they were in the 10%-11% range). This suggests that when the revised BIS capital standards are implemented (see Section 2.2), most Dutch banks will have a surplus capital buffer if the revised system produces higher capital requirements than the old system. As a consequence, the type of loan rationing effect that – as some have argued – resulted from the original introduction of the BIS capital requirements in 1992 might not be immediately evident as long as a major recession does not occur between now and the new system's implementation in 2005.

4.3 The Cost and Availability of Credit in the UK Loan Market

In this section, we compare the cost and availability features of borrowing in the UK with those of the Dutch loan market. Contrary to the Netherlands, there is a relatively extensive recent literature on small business financing in the UK, which includes academic and policy studies. The main insights from these studies are reported below.

4.3.1 Overall Market

As in the Netherlands, there is no single definition of a small business in the UK. At least three definitions are commonly used: (*i*) the UK Department of Trade and Industry (DTI) definition, (*ii*) the European Commission (EC) definition, and (*iii*) the UK Companies Act (UKCA) definition. These definitions are summarized in *Table 6*. As shown in the table, DTI uses an employee-based definition (where small firms are firms with less than 49 employees). The EC definition, on the other hand, uses four criteria (turnover, total book value of assets, number of employees and degree of independence from other companies), while the UKCA uses three components (turnover, total book value of assets, and number of employees). All three definitions define a small business as a firm having between 0 and 50 employees. A fourth definition proposed by the British Bankers Association (BBA) defines small by annual account turnover of up to £1 million (see Bank of England, Finance for Small Firms, 2000). Finally, in its Report on Competi-

tion in UK banking (henceforth referred to as the 'Cruickshank Report', March 2000) the UK government identified small and medium-sized enterprises (SMEs) as firms with a turnover up to £10 million and employing up to 250 people.

Like in the Netherlands, the retail market for SME loans in the UK is dominated by four (so called 'clearing') banks: NatWest/RBS, Barclays, Lloyds/TSB and HSBC. According to the Cruickshank Report, 83% of the loans to SMEs were extended by this group, with two banks (Barclays and NatWest/RBS) accounting for close to 50% of the market. The SME market is virtually absent of foreign competition. Foreign banks such as Citibank tried to penetrate the market in the 1990's, but eventually withdrew after finding it too difficult to compete with the very large branch networks (a total of 8,000 branches in 2000 compared to 12,000 in 1990) of the big four clearing banks. Thus, like in the Netherlands, domestic banking relationships appear to be important (see also Ongena and Smith, 2000). According to the Cruickshank report (2000), less than 3% to 4% of small businesses switches banks each year. Where switching does occur, this appears to be the result of the departure of a lending manager or the refusal of a credit application by the incumbent bank (see later).

4.3.2 Loan Pricing

Like the four large banks in the Netherlands, all major UK banks have developed and implemented RAROC systems, credit-scoring systems and rating systems. The intermediation spread (i.e., the spread of the base lending rate over the banks' cost of funds) in the UK appears smaller than that in the Netherlands (see also Chapter 3). This may in part be due to the more intense competition from foreign and international banks in the market segment for wholesale sterling loans and funds.

Both SME overdraft (current account) lending and term lending are priced at a premium over UK banks' base rate. As in the Netherlands, there appears to be a trend away from overdraft lending towards term lending. More specifically, in the year 2000 the percentages of overdraft loans and term loans in total lending to SMEs were 30% respectively 70%, compared to 49% respectively 51% in 1992. For the year 2000 the Bank of England estimated that 34% of UK bank loans had a maturity exceeding 10 years, 28% had a maturity between 5 and 10 years, 13% had a maturity between 3 and 5 years, and 25% had a maturity of less than 3 years. In 1999, the mean credit spread charged by banks over the base rate for small business loans was 3.4%, and varied between a low of 2.3% and a high of 5%. Less than 2% of the small business loans had spreads exceeding 6%. The mean spread has been relatively constant over the past 5 years.

Both the Bank of England (2000) and the Cruickshank report (2000) argue that banks earn very little direct profit on their bank lending to SMEs. Most of the banks' profits originate from relatively high charges for money transmission services (for example, payment and check processing and clearing) and the low interest rates paid on SMEs' deposit accounts. The general feeling in the UK banking sector is that increased competition from the Post Office and from Internet banking will tend to erode some of those profits in the not too distant future. Nevertheless, UK regulators believe that the

higher ROEs earned by UK banks, compared to other firms in the UK (with a difference in the order of magnitude of 5% per year), suggests the existence of a substantial degree of 'monopoly' power in money transmission and deposit account services to SMEs. As a consequence, the Cruickshank Report recommended that anti-trust action be undertaken against the big clearing banks by the DTI in order to reduce their monopoly power.

4.3.3 Collateral

Research by Clay and Cowling (1995) and Binks and Ennew (1997) found that the largest UK banks with the greatest market share in the UK loan market charge substantially higher interest rates than smaller banks for loans of equivalent risk, and in addition demand more collateral.

Small firms that are unable to meet the collateral requirements of these and other banks have potential access to the UK government's Small Firm Loan Guarantee Scheme, established in 1981. This guarantee scheme is still quite small, and in 1999 accounted for £200 million in loans to SME's out of a total volume of small business loans of over £36 billion. The DTI guarantees a loan in return for an additional interest spread or premium. For 'established' firms, the additional spread is 0.5% and the guarantee is up to 85% of the face value of the loan, while for new firms the spread is 1.5% and the guarantee is up to 70% of the face value of the loan. The default rate on these guaranteed loans is approximately 20%.

As is the case in the Netherlands, banks in the UK appear to view collateral as highly important, given the bankruptcy rules in place. Since the passage of the 1986 Insolvency Act there have been three ways to deal with corporate insolvencies in the UK: (*i*) liquidation, (*ii*) receivership, and (*iii*) Court Administration (see Franks, Nyborg and Torous, 1996). Of the three, liquidations occur in 75% of the insolvency cases, where receivership occurs around 20% of the time. The importance of collateral in the UK bankruptcy law lies in the role that it plays in giving creditors power over a firm's assets and over the remaining creditors of the firm, if that firm enters receivership. Specifically, when one or more of a firm's creditors has a particular lien on a firm's non-fixed assets, such as its inventory (called a 'floating charge'), then that creditor has the right to appoint a receiver to represent this claim. This receiver not only has few obligations regarding the welfare of other creditors of the firm, but also has the right to increase borrowing (which in that case is viewed as junior to the original creditor's claim) and to terminate contracts with suppliers. Thus, it is important that a bank has a direct collateral claim on assets backing current account loans. Moreover, if the bank takes a first lien collateral claim to fixed assets (buildings, plant, etc.), then it can repossess those assets, even if a receiver for floating charges is present. This implies that the receiver usually has to negotiate with those creditors who have claims (liens) on a distressed firm's fixed assets. Note that in the absence of floating charges there is no receiver, and a distressed firm is either liquidated or, in a small number of cases, placed under a court appointed administrator who is required to take the votes of all creditors into account. As such, the UK bankruptcy law

can be viewed as a creditor friendly law that provides strong incentives for UK banks to collateralize loans through either fixed assets or inventory.

4.3.4 Credit Availability

The Cruickshank Report (2000) could not find any evidence that SMEs faced difficulties in gaining access to bank loans. However, despite its relatively large and deep equity market (see Chapter 1), access to the UK equity market appears to be more problematic for smaller firms. This was the case even before the recent contraction in the IPO market for Internet Stocks. *Table 7* shows figures on European 'small cap' IPOs for 1994 and 1998 for the UK and a selected sample of European countries. The table shows that, while in 1994 the European equity IPO market was dominated by the UK, the market share of the UK in the IPO market has since declined. Indeed, through the German Neuer Markt and the EASDAQ, there were more German equity IPOs in 1998 than in the UK.

With respect to bank loans, the average rejection rate for the sample of small firms analyzed in the Cruickshank (2000) report was 5%, which is very low. The main reasons given for rejection were a poor business plan (in 40% of cases) and insufficient collateral (in 60% of cases). In addition, while a number of small firms in the UK have access to trade credit, they generally view this as only very short-term working capital finance, and not substitutable for (longer-term) bank loans. Moreover, only 2% of the SMEs in the UK used factoring or invoice discounting (amounting to 6% of external financing), which in any case are services predominantly provided by the big four UK clearing banks. Venture capital was found to provide only 3% of external financing for SMEs between 1995 and 1997. Finally, asset-backed financing, either leasing or hire-purchase, is widely used by SMEs in the UK, and represents perhaps the one major 'debt' alternative to long-term bank loans. It is estimated that around 40% of SMEs make use of leasing arrangements.

Overall, given the relative ease of access to bank credit, and average credit spreads over the base rate in the 3.5% range, SMEs in the UK appear to be relatively well served by the highly concentrated banking system. However, the UK system appears to have some downside in: (*i*) its excessive collateral demands, and (*ii*) high money transmission service charges and low deposit rates for SMEs that border on the anti-competitive side.

4.4 The Cost and Availability of Credit in the US Loan Market

In this section, we present empirical evidence with respect to the contractual mechanisms underlying the terms of bank loans to smaller and medium-sized firms in the US, and the US credit market. Our discussion builds on a large strand of empirical banking literature based on several recent small business surveys.

4.4.1 Overall Market

The US banking system has been undergoing profound changes over the last decade. Despite trends in technology (such as the rise of Internet banks without 'firewalls'), substantial deregulation (as a consequence of the Financial Services Modernization Act of 1999 and the Riegle-Neal Act of 1994), and consolidation through mergers and acquisitions, the US banking system is still far from the fully integrated and concentrated retail systems of the type found in the Netherlands, the UK, Germany (and Canada).[7] As is evident from *Table 8*, by the end of 1999 there were still more than 8,600 banks in the US, compared to 10,000 in 1995 and 14,000 in 1985. Furthermore, only one bank (the Bank of America) is close to approaching the 10% cap on national deposits placed on any one bank under the Riegle-Neal Act of 1994. Not only are US banks shrinking in number, since the 1950s the share of bank deposits in household assets has also been declining in a secular fashion. Flow of funds data show that banks' share of the total US household assets has fallen from over 50% in the 1950s to around 25% in 2000. This decline in banks' asset share has resulted from intense competition for savings and credit from pensions funds, mutual funds, finance companies, securities firms and financial markets (see also Boot and Schmeits, 1998).

Despite the decline in banks' market share, small businesses in the US have prospered since the end of the last recession in 1991. Specifically, small businesses with fewer than 500 employees in aggregate employ 53% of the private non-farm workforce, account for 47% of all sales and for 51% of GDP (see Small Business Administration: Facts about Small Businesses, 1999). While larger firms have downsized or have been restructured, new business formation reached record levels in 1998. In this year 60% of the growth in national employment could be attributed to micro-businesses in the 1-4 employee range. Of course, the recent decline in Internet stocks and technology stocks is likely to ameliorate this trend.

Table 9 shows the amount of small business lending by banks in the US. In this table, small business loans are defined by the Federal Reserve Board as loans with a size of $1 million or less. The table shows that total small business lending by US banks in 1999 accounted for $370 billion (i.e., approximately 37%) out of a total amount of bank lending of $1,020 billion.

Much of the information on US small business finance comes from two major surveys that were conducted by the Federal Reserve Board and the Small Business Administration (SBA) in 1987 and 1993, as well as from quarterly Surveys of the Terms of Business Lending.[8] While Congress technically requires a report on small business financing every 5 years, 1993 survey by the SBA is the last major survey based on which many academics

7 The Financial Services Modernization Act of 1999 replaced the restrictive Glass-Steagall Act of 1933, by allowing banks to enter securities and insurance businesses through the form of Financial Service Holding Companies. The Riegle-Neal Act of 1994 allowed banks to branch interstate (beginning in 1997). This act replaced the interstate branching restrictions that have existed since the McFadden Act of 1927.

8 The Federal Reserve Board's Survey of Terms of Business Lending collects data on gross loan extensions made during the first full business week in the mid-month of each quarter. The authorized panel size for the survey is 348 domestically chartered commercial banks and 50 US branches and agencies of foreign banks. The sample data are used to estimate the terms of loans extended during that week by all domestic commercial banks and all US branches and agencies of foreign banks.

and others have developed 'stylized facts' about the status of small business financing in the US. Despite their relatively old vintage, the US surveys do show some interesting contrasts to small business financing in the Netherlands. Indeed, the 1993 report shows that, while about 95% of small businesses with less than 500 employees in the US used some type of banking service, only 60% used bank-supplied commercial lines of credit, a much lower figure than that for the Netherlands (see Federal Reserve Bulletin, July 1995). A commonly used substitute for lines of credit were consumer credit cards. In 1993, about 40% of small businesses used personal or consumer credit cards for business purposes, often with the encouragement of bank card providers who generate high fees and interest charges on such cards. In addition, over 60% of the firms surveyed used trade finance and trade credit for short-term financing. Furthermore, 29% of the firms used non-depository institutions as a source of finance, and entered into asset-backed loans and leasing. The principal non-depository suppliers of these types of financing were finance companies (such as GE Capital) and brokerage firms. Especially the finance companies have proven to be very active competitors of banks in the area of small business financing, and are becoming major users of the government's (Small Business Administration's) Loan Guarantee Scheme.

A final observation is that, despite the shrinking importance of the banking sector in the US, banking relationships appear to be important for both credit availability and loan pricing of small business loans. Indeed, despite the large number of banks and the increased availability of credit from competing financial institutions, many small firms in the US are closely 'related' to their local bank (see also Petersen and Rajan, 2000). An interesting and important public policy question in this respect is whether the increased consolidation of the banking industry in the US, aligned with a shrinking number of small banks and higher turnover of account and senior bank managers, will (continue to) break up traditional bank-firm relationships in the US (see also Boot and Thakor, 2000). In the recent past, based on the 1993 survey, the duration of single bank relationships for small businesses averaged over 10 years (see Berger and Udell, 1995). Moreover, these relationships led to lower interest rates charged on loans (see Berger and Udell, 1995, Athvale and Edmister, 1999, and Blackwell and Winters, 1997), although Petersen and Rajan (1994) have argued that bank-firm relationships affect the availability of credit to smaller firms rather than (or more than) its price. This evidence seems to suggest that even in a more competitive banking system with multiple localized banks (like that in the US) switching between banks appears to be costly for small firms.

4.4.2 Loan Pricing

The base lending rate for loans in the US is the US prime rate. As shown in Chapter 3, the prime rate in the US appears to reflect a higher spread over the interbank offer rate (i.e., the bank cost of funds) than in either the UK, Germany or the Netherlands, and is also relatively 'sticky' overtime, especially when interbank rates are falling (see also Saunders and Mester, 1995). Despite the relatively high intermediation or bank spread between the prime rate and the interbank rate, the credit spreads or credit risk premi-

ums charged on loans in the US, however, appear to be lower than in other countries. Moreover, the propensity of banks to take risk appears to be greater.

With respect to the latter, an examination of the loan or credit rating systems of the 50 largest banks in the US by Treacy and Carey (2000) shows that, similar to banks in the Netherlands, Germany and the UK, the large majority of big US banks had ratings systems in place, varying in number from 3 to 4 categories for problem loans and from 2 to 20 categories for 'pass' loans. When converted into S&P/Moody's bond rating equivalents, and broken into non-investment grade (i.e., below BBB) loans and investment grade (i.e., BBB and above) loans, more than 50% of the loans provided by the largest 50 US banks were found to be below investment grade quality. Interestingly, for the smaller banks in the sample, approximately 75% of the extended loans were made to below investment grade borrowers. There are at least two explanations for these findings. First, an increase in competition from both the capital market (for high quality borrowers) and from larger banks and finance companies (for lower quality borrowers) has pushed some US banks into more risk-taking. Second, the 8% BIS risk-based capital ratio has mispriced (underpriced) the capital at risk of low quality borrowers versus high quality borrowers, and the resulting 'capital arbitrage' has induced some banks to take on more risk. The effect of capital arbitrage is likely to be ameliorated with the passage of the BIS capital adequacy reform of 2001, discussed earlier in this chapter (see Section 2.2). Observe however that this extreme form of risk shifting is not apparent in the UK, the Netherlands or Germany.

Almost paradoxically, while US banks appear to take on more risk than Dutch banks, and rating systems and credit scoring systems for small business loans are widely used by US banks, the credit spreads (or credit risk premiums) over the base rate in the US appear to be lower. For example, based on the 1993 National Survey of Small Business Financing, Berger and Udell (1995) found that the average risk premium over the prime rate for small business loans was 1.49%. For loans smaller than $500,000 the average risk premium was 1.73%, and for loans larger than $500,000 it was 1.32%. Scott (1999), using 1995 survey data from the National Federation of Independent Businesses, found a median spread over prime of 2%. These findings are consistent with the credit spreads reported in the Federal Reserve Board's Survey of the Terms of Small Business Lending (2001), which are captured in *Figure 1*. The figure presents a 10-year time series for the period 1987-1997 of the credit spreads over prime of loans for an amount less than $100,000 and for loans between $100,000 and $1 million. As can be seen, the credit spreads are quite small, and rarely exceed 2%. This is the case even for the smallest loans in the 1989-1991 recession. These observations suggest that there may be a significant 'non-risk' element in the credit spreads on Dutch and UK small business loans, since the spreads over the base lending rate in these countries appear to be higher than in the US.[9]

Table 10, also derived from the Federal Reserve Board's Survey on the Terms of Small Business Loans, captures the current loan rates on US loans, their weighted average risk

9 Note that many large borrowers pay 'below prime', due to competition from the capital markets. Alternatively, the loan rate of large borrowers may be indexed to some foreign dollar rate such as LIBOR.

ratings (based on the Federal Reserve's own scale of 1-5, with 5 being the highest risk), their average maturity (for fixed rate loans) respectively the average time to repricing (for floating rate loans), and the percentage of the loans that is secured by collateral, all as a function of loan size. The table shows that the rates on loans in the $1,000 to $99,000 category are close to those in the $100,000 to $999,000 category (with a difference of 0.82%). However, for larger wholesale loans (i.e., loans over $1 million) for which capital markets and also foreign banks are likely to compete, the loan rates are clearly much lower. For example, the difference in loan rates between loans larger than $10,000,000 and those smaller than $99,000 is 2.79%. Note that part of this difference is attributable to risk differences, in that the average (Federal Reserve) risk-weighting of the below $99,000 loans is 3.3 out of 5, while for the largest loans it is 2.7 out of 5.

Observe that the numbers in *Table 10* reflect only interest rates charges. Historically, banks in the US have also charged 'compensating balances' on loans, as well as origination, 'usage' and/or 'non-usage' fees for lines of credit (overdraft lending).[10] These additional charges, however, have become less important over time. According to the small business survey, only 7% of small businesses reported was still subject to compensating balances in 1993. Moreover, average fees for upfront and usage fees on credit lines have fallen to the 1/8% to 1/4% range for small firms, and have almost completely disappeared for those firms with access to either the international loan market or the capital markets (for example, the US commercial paper market). Consequently, both the explicit and implicit costs of small business financing in terms of premiums related to risk and fees, seem to be relatively low in the U.S. However, this is offset by the apparently high intermediation spread between the prime rate and the underlying bank cost of funds, and the stickiness of the US prime rate over time (see Saunders and Schumacher, 2001, and Chapter 3).

4.4.3 Collateral

Contrary to the Netherlands and the UK, collateral does not appear to play a central role in the lending process in the US. The 1993 survey of small business lending determined that 53% of loans to small businesses were backed by collateral (see Berger and Udell, 1995). Other studies by Ang, Lin and Tyler (1995), Avery, Bostic and Samolyk (1998) and Scott (1999) have found that small business loans are backed by collateral in less than 60% of the time. The figures from the recent Federal Reserve Board Survey of the Terms of Small Business Lending reported in *Table 10* are somewhat higher. As the table shows, currently 83.7% of the loans for amounts less than $99,000 are collateralized, while 70% of loans between $100,000 and $999,000 are collateralized. In contrast, only 33.6% of the largest loans (i.e., loans for amounts higher than $10,000,000) are collateralized. These higher collateral figures may (in part) reflect a tightening of credit terms in anticipation of the forecasted recession. These figures furthermore have to be interpreted with some caution, since personal guarantees are quite frequently used in the practice of small busi-

10 A compensating balance requires the borrowers to keep a proportion of the loan (usually less than 10%) in either an interest-bearing or non-interest bearing deposit account at the bank. This both increases the effective interest rate on the loan and provides some 'self-collateral' to the loan.

ness lending in the US. While such guarantees are not perfect substitutes for collateral (and figures on the scale of such guarantees are hard to find), they do appear to be a common part of loan contracting. Nevertheless, lower collateral requirements in the US should be surprising, given the apparent riskiness of US loan portfolios discussed above (see *Table 10*).

As is the case in the Netherlands and the UK, for firms that are required to post collateral but are unable to do so, the US government provides a guarantee scheme through the Small Business Administration (SBA). The SBA loan guarantee scheme has grown to over $10 billion in loan guarantees outstanding, with about 7,000 approved lenders. The maximum size of a loan that can be guaranteed is $2 million. For loans of less than $150,000, the maximum guarantee is 85% of the loan's face value. For loans over $150,000, the guarantee falls to 75%. While loan rates for SBA guaranteed loans are generally negotiated by the borrower and the lending institution, the SBA imposes maximum spreads over the US prime rate on such loans which depend on their size and maturity. For fixed rate loans, the maximum spreads currently vary between 2.25% and 2.75%. In addition, the SBA charges guarantee and servicing fees (which can be passed on to the borrower). Depending on the size of the loan, the guarantee fee varies between 2% and 3.5%, while the servicing fee is ½%. Major lenders using the guarantee program are finance companies as well as banks.

Perhaps one reason for placing more focus on pricing and credit availability in the US than on collateral is that the US Bankruptcy code, and especially Chapter 11, tends to be (equity) owner friendly rather than debtor (banker) friendly. While the majority of bankruptcy filings in the US (i.e., about 70%) constitute liquidations or so called Chapter 7 filings, the remainder of the filings take place under Chapter 11. Chapter 11 allows a distressed firm to remain in operation while a plan of reorganization is worked out with its creditors. During this process, equity holders and managers are protected and substantial control rights are given to the firm. The rationale behind this 'debtor in possession' arrangement is that if equity holders are not wiped out, they have strong incentives to turn the firm around. The effects on banks (and their collateral claims) of a Chapter 11 filing can be quite adverse. Indeed, Dahiya and Saunders (2001) find that the announcement of a Chapter 11 filing by a major costumer of a bank has a negative effect on that bank's equity value. The major reason for this is that under a Chapter 11 filing, most creditor claims are frozen (as part of the 'automatic stay arrangement'), while the existing owners/managers have discretion to negotiate new financings (including loans from different banks) that have priority over outstanding bank loans. Thus in a number of cases, Chapter 11 results in deviations from absolute priority rules, away from old lenders and toward new lenders and equity holders. This appears to be totally different from the UK and the Netherlands, where bankruptcy rules appear to take little account of the incentives and welfare of a distressed firm's stockholders (see Franks, Nyborg and Tourous, 1996) and are much more friendly to pre-bankruptcy creditors.

4.4.4 Covenants

According to Carey, Prowse, Rea and Udell (1993), most US small business loans are not subject to covenant restrictions, because of the problems and costs associated with verifying whether covenants have been breached or not. The financial statements of smaller companies are likely to be less comprehensive, and of lower quality, than those of larger companies, and are furthermore less frequently updated. Indeed, the major way for US banks to control for small firm risk (other than through collateral requirements and/or pricing) is via loan maturity. Thus, it is common for lines of credit and term loans to small firms to be of a relatively short maturity compared to loans to more mature and larger firms. Where covenants exist, they tend to be less 'tight' (or strict) the larger the firm. In a study of US bank loan covenants, Paglia and Mullineux (2000) found that covenant 'tightness' increased with a firm's agency and information-related problems, but was weakly negatively related to measures of the firm's growth opportunities and its collateral guarantees (see also Berlin and Mester, 1992). Moreover, the more lenders an individual borrower has, the larger the number and the restrictiveness of its covenants.[11]

4.4.5 Credit Availability

There appears to be a continuing concern regarding the effects of the consolidation in the US banking sector on the scale of small business lending. Conventional wisdom suggests that smaller banks are more likely to make smaller loans (i.e., loans to small businesses). This is the case since the costs of monitoring and information collection for larger banks are too high relative to the spreads and profits they can earn on such loans (see also Petersen and Rajan, 2000). Thus, as small banks disappear, either through exit or through mergers with larger banks, small business lending is likely to suffer.

On the face of it, lending data tend to give some support for this view. *Table 11* portrays the growth rates of loans of different sizes during the period 1995-1999. From the table it follows that loans for amounts below $100,000 have shown the slowest growth rates during the period 1995-1999 (with a 2.5% growth in the period 1998-1999), whereas loans larger than $1 million demonstrated the largest growth (14.6% in the period 1998-1999). The key question, however, is whether this diference in growth rates is caused by supply-side effects (i.e., results from bank mergers) or demand-side effects (i.e., results from borrowers using substitute forms of financing). *Table 12* shows relevant figures on small business loans and asset growth for the 57 largest US banking organizations (bank holding companies). The table indicates that out of a total amount of $398 billion in small loans (i.e. loans less than $1 million) outstanding in 1999, an amount of $172 billion (43%) was made by the 57 largest bank holding companies. This constitutes a $30 billion (21%) increase relative to 1998. For all other banks, the amount of small business loans extended in 1999 decreased by $1.9 billion in comparison to 1998. However, it should be noted that the total assets of the 57 largest bank holding compa-

11 With respect to maturity, the Federal Reserve Board's Survey of the Terms of Business Lending (February 2001) showed that the average maturity/repricing interval for loans of $99,000 or less was 178 days compared to only 28 days for loans of over $10,000,000. Not also that approximately 77% of both small and large loans are made under loan commitment (current account loans).

nies assets increased by 23% during the period 1998-1999, while the assets of all other banks shrank by 17.4%. Moreover, the 57 largest bank holding companies' total business loans increased by 31% during the period 1998-1999, while the smaller loans increased at a slower rate (21%). *Table 13* shows the small business lending amounts of a select group of large US 'universal' banks that are (in some ways) the most comparable to Dutch universal banks. The most 'universal' US bank is Citigroup, which combines Citibank, Travelers (insurance activities) and Salomon/Smith Barney (securities activities). The table shows that the ratio of Citigroup's small business loans to total business loans (with small business loans defined as loans under $1 million) in 1999 was 15.6%. Other large US banks, including the largest (Bank of America) also have ratios in this range. Note that both JP Morgan (now acquired by Chase) and Bankers Trust (now acquired by Deutsche Bank) both have miniscule small business loan portfolios, mainly because of their strategic emphasis on global wholesale banking.

Academic studies trying to find a link between increased bank concentration and declines in small business lending have generally been unsuccessful. For example, Berger, Saunders, Scalise and Udell (1998) found that, while the direct impact of a merger between a large and a small bank in a local market was a decline in small business lending, this effect was offset (in many cases more than offset) by new entrants (so called de novo banks) or by other smaller banks and finance companies in the same market expanding their small business lending.[12] Moreover, mergers between small banks tended to increase small business lending directly. Thus, the evidence to date does not support the increased bank concentration (supply-side) story as a major determinant of the recent slower growth of small business lending in the U.S.

4.5 The Cost and Availability of Credit in the German Loan Market

We finally discuss the cost and availability features of bank loans in the German credit market. Our analysis builds on a few recent academic studies, based on a small business survey.

4.5.1 Overall Market

As discussed in Chapter 1, the German financial system closely resembles that of the Netherlands. There are a large number of similar features, including the dominating presence of a small group of universal banks[13], the relatively small size of the equity market, the absence of a hostile market for corporate control and takeovers, the limited size of the (non-bank) corporate bond market, and the role banks play in corporate governance.

The 'housebank' nature of the German financial system can be traced back to an 1884 law, which restricted corporate access to the German stock exchange by increasing the minimum size of public offerings and the number of years firms needed to exist before they could be publicly listed (see Carney, 1997). Partly as a result of the restricted

12 It might be noted that the number of de novo banks (new bank charters) in the US has been increasing at the rate of 200-300 a year in recent years.

13 Although, historically, the share of the deposit base of the three largest banks in Germany has been less than 10%.

access to equity markets, only 2,800 German corporations are publicly traded corporations (AG's), while the vast majority of 220,000 firms are limited liability companies without tradable equity (GmBH's). Only a small number of German firms have their shares listed on major exchanges, and only about 100 companies have issued shares that are widely held. Further limiting shareholders' power is the fact that shares are issued in bearer form and are normally kept with banks who act as custodians. The bearer form of shares has two major effects: (*i*) it enhances the corporate control powers of banks who often acquire the proxy right to vote the shares at shareholder meetings, and (*ii*) it results in less pressure from stockholders for transparent accounting and information disclosure to outside investors (since the bearer form makes ownership confidential).

In such a setting, the major banks, including the big 'three' (Deutsche Bank, Dresdner bank and Commerzbank), have developed considerable control power over the corporate sector. This power originated from both the prominent role of bank financing (as the principal source of external financing) for small, medium-sized and many large corporations in Germany and the control that banks have been able to exert through their direct and indirect equity stakes. Indeed, while the direct share of equity holdings of German companies rarely exceeds 25% (see Gorton and Schmid, 2001), their ability to vote as proxy shareholders (via their custodial relationship) and their ability to sit on, and often chair, supervisory boards of directors gives them powers analogous to large blockholders of shares in market based financial systems, such as the US and UK.[14]

Many German bankers have argued that they use their control power in a favorable fashion by disciplining poorly performing managers, reducing agency costs and increasing shareholder value (in a manner similar to large equity blockholders in market based systems). An alternative view, which from time to time has been put forward by the German government, is that this control power puts the banks in a monopoly position and allows them to extract additional (monopoly) profits at a relatively low risk. An important empirical question therefore is how the German 'housebank' or main bank system impacts loan pricing, collateral requirements and credit availability.

This issue is especially important for small companies in Germany, where SMEs (here defined as firms with less than 500 employees) represent more than 65% of the firms in the non-agricultural sector (see Harhoff and Korting, 1998), and where small firms have historically been more prevalent than in either the US or the UK (see Loveman and Sengenberger, 1991). These smaller companies normally bank with one (or very few) financial institutions. From a survey of 1,127 German firms, with a median number of employees equal to 10 and a median age of 11 years, Harhoff and Korting (1998) found that 80% of the firms with less than 5 employees received external finance from just one banking institution, while 66% of the largest firms received external finance from only one bank as well.

14 It should be noted that bank equity holdings in Germany have often come about in an involuntary fashion via corporate distress and family (owner)

4.5.2 Loan Pricing

There has been a small number of recent studies which have used credit file data on small and medium-sized borrowers from five large German banks in order to determine the effects of banking relationships and other factors, such as size and internal credit risk ratings, on loan pricing (and, in particular, on the level of credit spreads). From access to the credit file histories of individual borrowers and their ratings, important insights can potentially be derived regarding the loan pricing behavior of the major German banks. At least three of these studies fail to find a positive link between the strength or duration of a housebank relationship and the loan rate (see Elsas and Krahnen, 1998, Machauer and Weber, 1998, and Machauer and Weber, 2000). Nor does there appear to be a relationship between the number of banks that a customer uses and loan pricing. Indeed, as is the case in the Netherlands, the UK and the US, loan pricing in Germany appears to be (increasingly) risk related and size related, as banks develop internal rating systems for small and large borrowers along with credit-scoring systems. For example, using a common six point rating scale for 5 German banks to rate 200 of their small and medium-sized borrowers during the period 1992-1996, Machauer and Weber (1998) found that, compared to the highest two credit rating categories (i.e., class 1 and 2), class 3 borrowers had to pay an additional spread of around 1/3% over the base lending rate, while the worst rated borrowers (i.e., class 6 borrowers) had to pay a 1.2% higher spread. Interestingly, loan prices (and spreads) were relatively insensitive to loan rating migrations. Overall, there seems to be little empirical support for the view that German banks have used their corporate governance powers to extract higher 'rents' in the loan market through larger credit spreads. Of course, given the 'universal' nature of banking services in Germany, this does not mean that rents aren't being generated elsewhere in the bank, for example through the charges for payment and money transmission services, as appears to be the case in the UK.

4.5.3 Collateral

The German bankruptcy law (as introduced in 1999) appears to lie somewhere between the relatively creditor friendly law of the UK and the relatively debtor friendly law of US Chapter 11. Historically, the German bankruptcy law has been creditor friendly. A company was either compulsorily liquidated at the request of its major creditors, or it was placed in administration (or so called 'composition proceedings'), in which case secured creditors had preferred rights to up to 100% of their claims. Under the post-1999 bankruptcy code, there can be an 'automatic stay' of secured claims for up to 3 months and there are no preferred creditors. Under the new scheme, the court appoints a creditor committee and an insolvency administrator who works on a plan with the creditor committee (see Franks, Nyborg and Torous, 1996). The plan can be highly flexible and may involve continuing the stay on secured claims, reorganizing the company and/or selling the company in whole or in part.

In their Survey of Small and Medium-sized Borrowers, Elsas and Krahnen (1998) found that the average level of collateralization of a loan was 68%, with 8% fully collateralized and 34% uncollateralized. Importantly, both Elsas and Krahnen (1998) and

Machauer and Weber (1998) indicate that the percentage of collateral required from borrowers with 'housebank relationships' was actually higher than that from borrowers with no such relationship. Thus, while a borrower with a housebank may find its loan price insensitive to that relationship, there is evidence that to cement a long-term relationship a borrower has to post more (not less) collateral.

4.5.4 Credit Availability

While relationship borrowers appear to have to hold relatively more collateral, the evidence from the studies of Machauer and Weber (1998, 2000), Elsas and Krahnen (1998) and Harhoff and Korting (1998) nevertheless suggests that housebanks do provide their relationship customers with greater liquidity and/or credit insurance over time. In particular, housebanks appear to be willing to support their long duration customers during times of financial distress (similar to the results found by Hoshi, Kayshap and Scharfstein (1991) for Japanese main banks and their customers). Thus, housebanks provide a degree of credit availability insurance to its customers (see also Hellwig, 1990).

Overall, the German housebank relationship seems to have a neutral effect on loan pricing, a negative effect on collateral requirements and a positive effect on credit availability. Clearly, for those firms that are able to post collateral at low cost, the housebank relationship appears to provide net benefits.

4.6 Summary and Conclusions

This chapter has sought to summarize and compare (where possible) salient features of bank loan contracts, and the availability of credit to smaller and medium-sized firms in four countries: the Netherlands, the UK, the US, and Germany. For each of the countries we gave a brief overview of the (competitive) structure of the credit market, and examined the determination of the credit spread and the role of collateral requirements, loan covenants and loan maturity, using empirical evidence that was predominantly based on small business surveys. We furthermore linked our findings to (potential differences in) the bankruptcy law and other aspects of the competitive and regulatory environment that may have an impact on the contractual mechanisms underlying the terms of bank loans.

Our main conclusion is that the spreads in loan interest rates (i.e., both intermediation spreads and credit spreads), as well as collateral requirements and credit availability appear to differ across countries. Focusing on the Netherlands, credit spreads appear to be high and collateral requirements appear to be high, relative to a number of other countries. However, solely attributing these findings to the highly concentrated banking system in the Netherlands would – given the UK, German and US experience – be misleading. Other factors, such as the nature and working of the Dutch bankruptcy system (and in particular, the priority rules and lender liability laws), need to be considered, as well as the cost of other services supplied by banks, such as payment services. For example, while risk premiums on small business loans in the UK may be lower than those in

the Netherlands, the cost of payment services for small businesses appear to be much higher. That is, cross-subsidy and transfer-pricing effects need to be taken into account. Moreover, the role of banks in guaranteeing availability of credit is important.

What is clearly needed is comprehensive pricing data on all major services supplied by the largest banks to small customers in each country. Only then can a 'full' picture of the returns and risks of small business lending by large banks across countries be developed. Unfortunately, such comprehensive comparative data are currently unavailable.

Table 1: Rabobank Group Consolidated (Millions of Euros)

	1999	1998
Total Lending	170,492	139,948
Assets	281,218	249,718
Corp Lending	90,830	75,795
Sub Loans & Advances	58	214
Sector*		
Agriculture Sector	18%	19%
Trade and Ind. Sector	40%	38%
Private Individuals	42%	43%
BIS Ratio	10.5%	11.1%
Maturity		
On demand/undated	3,877	16,024
≤ 3 months	38,397	17,058
> 3 months to ≤ 1 year	9,875	9,008
>1 year to ≤ 5 years	27,420	19,796
> 5 years	90,923	78,062

* Market Coverage Agricultural sector: 87%
Market Coverage Small and Medium-sized Enterprises: 38%.

Table 2: Rabobank Nederland (Millions of Euros)

	1999	1998
Total Lending	43,638	32,817
Assets	175,345	157,740
Private Sector Lending	34,911	24,761
Sector		
Agricultural Sector	20%	23%
Trade and Industrial and Services Sector	80%	77%
Maturity		
On Demand	4,591	5,851
≤ 3 months	23,240	12,470
>3 months ≤ 1 year	2,930	3,240
> 1 year ≤ 5 years	7,924	6,676
> 5 years	4,953	4,580

Table 3: ING Consolidated (Millions of Euros)

	1999	1998
Total Lending	201,798	153,821
Assets	492,815	394,925
Subordinated	484	332
Loans by Security (Domestic)*		
Total	102,263	87,693
Guaranteed by Public Authorities	9,357	9,189
Secured by Mortgages	58,196	52,237
Loans Guaranteed by Credit Inst's	674	538
Other Personal Lending	3,281	2,991
Other Corporate Loans	30,755	22,738
BIS Ratio**	10.86%	10.38%
Maturity		
On demand	26,472	19,044
≤ 3 months	43,267	35,562
> 3 months to ≤ 1 year	16,025	15,811
> 1 year to ≤ 5 years	35,546	33,565
≥ 5 years	80,488	49,732
Sector		
Agric., Hotel, Foresting and Fish	1,842	1,706
Manufacture	22,575	15,488
Service Industrial	46,879	39,039
Firm Institutions	44,184	31,870
Other	76,648	63,837
Public Auth's	9,670	1,774

* Prior to provisions for loan losses

** ING Bank NV

Table 4: Fortis Consolidated (Millions of Euros)

	1999
Total Lending	221,392
Assets	406,109
Private Lending by Sector (x 1,000)	
Total	149.3
SMEs	30.4
Enterprises	32.9
Individuals	40.3
Other	45.7
By Industry (x 1,000)	
Total	149.3
Agriculture, Forestry, Fish.	1.4
Energy and Water	1.8
Chemicals and Plastics	3.0
Metallurgy	3.1
Other Industry	7.9
Const. and Mechanical Engineering	4.8
Trade, Hotels and Catering	13.2
Trans. And Communications	5.7
Real Estate	2.8
Other Services	36.5
Not Classified	42.1
Financial Services and Ins.	22.7
BIS Ratio	10.6%

Table 5: ABN AMRO Consolidated (Millions of Euros)

	1999	1998
Total loans	259.7	220.5
Assets	457.9	432.1
Loans to Private Sector	207.0	179.2
Domestic Loans (NL Division) to Private Sector	88.6	80.6
Sector		
Public Sector	12,097	7,334
Commercial	130,003	110,757
Retail	81,679	72,739
Professional	40,742	34,058
Loans by Security		
(a) Commercial		
Public Auth. Guarantees	6,109	5,474
Mortgages	18,974	15,584
Sec's	2,337	2,699
Bank Guarantees	3,114	3,093
Other Collateral and Unsecured	99,469	83,907
(b) Retail		
Public Auth Guarantees	3,628	3,596
Mortgages	58,082	50,523
Other Types of Collateral and Unsecured	19,969	18,620
Commercial Loans by Industry		
Agric., Mining and Energy	10,718	8,957
Manufacture	30,948	26,649
Const. and Real Estate	15,067	12,624
Wholesale and Retail Trade	19,257	17,536
Transportations and Communications	10,451	9,568
Financial Services	17,639	16,348
Business Services	12,290	8,477
Education, Health Care and Other Services	13,633	10,598
BIS Capital Ratio	10.86%	10.48%

Table 6: UK Definitions of Small Business

Department of Trade and Industry

	Employees
Micro firm	0 – 9
Small firm	0 – 49
Medium firm	50 – 249
Large firm	250+

European Commission

	Micro firm	Small firm	Medium firm
Turnover	Not applicable	Max € 7mn	Max € 40mn
Balance sheet	Not applicable	Max € 5mn	Max € 27mn
Employees	Max 10	Max 50	Max 250
Independence criteria*	Not applicable	25%	25%

* The independence criterion refers to the maximum percentage that may be owned by one, or jointly owned by several enterprises not satisfying the same criteria.

Companies Act

	Small company	Medium company
Turnover	Max £2.8 mn	Max £11.2 mn
Balance sheet	Max £1.4 mn	Max £5.6 mn
Employees	Max 50 Max	Max 250

Source: Bank of England, 2000.

Table 7: European Small Cap IPO's

	1994	1998
UK	3000	1700
Germany	250	2300
France	250	1100
Italy	100	600
Switzerland	200	1100

Table 8: Numbers of Reporting Banks by Asset Size, 1995-1999

Bank Asset Size	1995	1996	1997	1998	1999
<$100 million	6,980	6,465	6,047	5,644	5,302
$100 million-$500 million	2,521	2,548	2,590	2,656	2,683
$500 million-$1 billion	256	260	292	303	290
$1 billion-$10 billion	326	326	300	302	309
>$10 billion	66	71	64	61	75
Total	**10,149**	**9,670**	**9,293**	**8,966**	**8,659**

Source: Federal Reserve/SBA

Table 9: Small Business Loans in the U.S., 1999 (Billions of dollars)

Loan Size	U.S. Banks	% Change 99/98
<$100,000	$111.5	2.5%
<$250,000	$187.8	4.0%
<$1,000,000	$370.8	7.6%
Total Business Loans	**$1,020.2**	**12.1%**

Source: Federal Reserve/SBA

Table 10: Small Business Loan Data from Survey of the Terms of Bank Lending (Feb 5-9, 2001)

Size ($thousands)	Weighted Average Loan Rate	Amount of Loans ($ millions)	Weighted Average Risk Rating	Weighted Average Maturity/ Repricing Interval (Days)	Secured by Collateral (%)
1-99	9.45	2,760	3.3	178	83.7
100-999	8.63	10,194	3.2	93	70.2
1,000-9,999	7.50	31,000	3.0	53	38.0
10,000+	6.66	58,472	2.7	28	33.6

Table 11: Change in the Dollar Amount of Business Loans by Loan Size 1995-1999

Loan Size	95-96	96-97	97-98	98-99
<$100,000	4.8%	2.9%	3.0%	2.5%
$100,000 - $250,000	5.7%	5.2%	8.1%	6.3%
$250,000 - $1 million	5.7%	5.7%	7.7%	11.2%
>$1 million	5.1%	11.5%	13%	14.6%

Table 12: Small Business Loan and Asset Growth in Large BHCs and All Other Banks June 1998 to June 1999 (Billions of Dollars)

	Small Business Loans under $1 Million		Bank Assets	
	Large BHCs	All other	Large BHCs	All other
1999	171.7	226.9	3,277	1,459
1998	141.8	228.7	2,653	1,766
Change (Billions of Dollars)	29.9	-1.9	624	-307
Change (Percent)	21.0	-0.8	23.5	-17.4

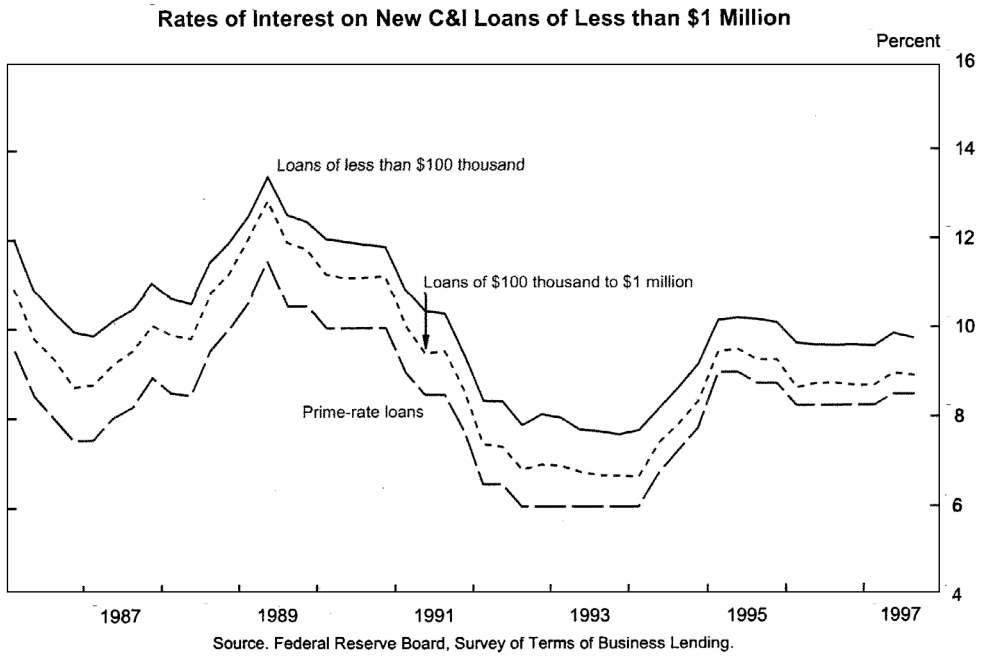
Source: Small Business Administration

Table 13: Small Business Lending by Major U.S. Bank (June 1999)

		SBL/TBL	SBL/TA
1	Citigroup	15.6%	1.9%
2	Chase Manhattan	12.7%	1.8%
3	Bank of America	14.3%	3.2%
4	J.P. Morgan	0.4%	0%
5	Bankers Trust	0.2%	0%

Source: Small Business Administration

Figure 1


Rates of Interest on New C&I Loans of Less than $1 Million
Percent
16
14
12
10
8
6
4
Loans of less than $100 thousand
Loans of $100 thousand to $1 million
Prime-rate loans
1987
1989
1991
1993
1995
1997
Source. Federal Reserve Board, Survey of Terms of Business Lending.

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The Amsterdam Center for Corporate Finance (ACCF) is a thinktank specializing in the financial management of corporations and the operations of the financial sector. The ACCF promotes high quality research on the interface between financial theory and corporate policy. With a variety of activities, it provides a forum for dialog between academics and practitioners. The ACCF is an independent foundation and is supported by major financial and industrial corporations, consultancy agencies and (semi) government bodies. It is affiliated with the Finance Group at the University of Amsterdam.

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