

Corporate Finance in Germany and France

The present analysis of corporate finance in Germany and France is the outcome of a joint research project by staff members of the Banque de France and the Deutsche Bundesbank ¹. This study presents a description and an analysis of asset and liability structures. The document also contains an econometric estimation of the borrowing behaviour of incorporated manufacturing firms in Germany and France.

The results obtained show that capital structures in the two countries are characterized by diverging underlying institutional conditions. They are based on the specific legislative and legal factors in each country and on the special role played by banks in the financing of SMEs. Differences in the asset structures of manufacturing firms in Germany and France are less pronounced.

The aim of the econometric analysis is to estimate the microeconomic determinants of the borrowing behaviour of French and German firms over the 1990-95 period, using two balanced samples. Despite the large differences between the two countries in terms of debt trends over time and size class, confirmed by the distinct role of size and time dummies, the main result is the similarity of the coefficients of the micro determinants in France and Germany in the short run. Firm growth has a positive impact on borrowing according to the theory of signalling costs, whereas the negative correlation of profit and debt supports the pecking order theory. Cost of finance and debt are negatively correlated and the impact is stronger in both countries for larger firms than for smaller ones.

The results of this research provide a preliminary basis for the assessment of the monetary transmission mechanisms in European Monetary Union.

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¹ This article is a summary of the study entitled Corporate Finance in Germany and France by Hans Friderichs, Dieter Gerdesmeier, Élizabéth Kremp, Bernard Paranque, Annie Sauvé, Manfred Scheuer and Elmar Stöss. The authors would like to thank Bruno Cillard, Didier Cochonneau and Claude Truy for their work in building up the databases.

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² At the Banque de France Companies Observatory at the time of the study.

1. Methodology and Accounting Adjustment Procedures

The following analysis of the financial structures of enterprises is based on the analysis of the balance sheets and annual accounts of manufacturing corporations. The sample exclusively considers incorporated companies, i.e. public stock corporations and limited liability companies. Data on firms are available at the Bundesbank (corporate balance sheet statistics) and at the Banque de France from the CdB (Centrale de bilans) database, a collection of data from firms providing their annual accounts on a voluntary basis.

Description of the samples

In Germany, up until the start of Stage Three of EMU on 1 January 1999, the collection of financial statements of enterprises was linked to the implementation of rediscount operations. Pursuant to section 19 of the Bundesbank Act, the Bundesbank, within the scope of its rediscount operations with credit institutions, is only permitted to purchase or lend bills of exchange backed by three parties which are known to be solvent. The enterprises concerned are requested to submit their annual accounts to the branch offices of the Bundesbank so that it may perform credit assessment.

The assumption that the Bundesbank's base material represents a positively biased sample of firms cannot be clearly confirmed, especially because comparisons with insolvency statistics demonstrate that the bankruptcy ratios in the Bundesbank sample are quite similar to those for the whole population of firms. This conclusion could be partly explained by the fact that, in addition to the balance sheets of the enterprise presenting the bill to the credit institution, the annual accounts of the other liable party are requested, on which the rediscounting bank often has no direct information.

The study concentrates on the period 1987-1995 for Germany and 1987-1996 for France¹. The year 1987 seemed to be especially appropriate as a starting point because in that year the Fourth EC Directive was translated into German accounting legislation (5 years later than in France). The minimum harmonization of the accounting regulations thus achieved provides the necessary framework for the development of a common harmonized presentation of balance sheets of corporations in both countries.

In the descriptive analysis, the two-year sliding balanced sample procedure was used in order to include the dynamic segment of the base material, provide a truer image of economic activity and obtain a more representative sample. Another approach was adopted in the econometric analysis: the 1990-1995 balanced sample largely reduces the technical problems of model specification within econometric panel analysis.

The French sample covers nearly 15,000 companies and the German sample more than 9,000 firms from western Germany. Samples were broken down by size classes according to a detailed classification scheme based on the number of employees. Such a classification appears more appropriate for a long-term analysis than turnover-based size classes, as the classification variable is less affected by cyclical variations in business activity and inflation in the two countries. Five size classes have been defined².

¹ Most of the 1996 annual accounts were already in the database when the project was launched.

² From 0 to 19 employees, from 20 to 99, from 100 to 499, from 500 to 1,999 and more than 2,000

.../...

Firms of the second size class (20 to 100 employees) represent 54% of the sample in France and 44 % in Germany. Firms with 20 to 500 employees make up 75% of the French sample and 70% of the German one. Large firms with more than 500 employees account for 9% of the German sample and 4.7% of the French sample.

On the basis of employee numbers, the population of manufacturing firms in the CdB database covers approximately 60% of the total workforce in manufacturing industries. The coverage comes to 57.6% for firms with 20 to 500 employees and nearly 80% for large firms with more than 500 employees.

The 9,000 companies selected only account for roughly 13% of the total population of incorporated west German manufacturing firms, but for more than 70% of their total turnover.

The German samples primarily consist of corporations in the intermediate and capital good industries, while durable and non-durable consumer goods are covered to a far less extent.

Unlike the German sliding samples, the French coverage ratios display a more homogeneous composition by sector of economic activity. The higher proportion of very large enterprises with more than 2,000 employees in the German sample (2.0% in Germany against 0.7% in France) corresponds to the economic situation but might, along with the strong representativeness of a few sectors, reflect the extent to which the bill of exchange is used as a financing instrument in each particular industry.

Two statistical indicators are used in the descriptive analysis: the median and the weighted mean. The median³ shows the central behaviour of firms and is not influenced by large firms as is the case for the weighted mean⁴. However, the weighted mean reflects the overall situation of the sector and, because of its additive property, is used to show the trend in the total liabilities of manufacturing companies.

³ The median which, once the companies have been ranked in ascending order of the ratios, separates the population examined into two equal parts. It expresses a value central to the distribution of the data.

⁴ The weighted mean (or mean ratio) is the mean of the individual ratios weighted by the value of the denominator of the ratio. It may be calculated by dividing the sum of the numerators by the sum of the denominators.

One of the objectives of the project was to promote the exchange of information between both institutions, in order to provide a comprehensive description of the financial structures of French and German incorporated companies. Considerable efforts were made in order to harmonize the data for both countries.

The translation of the Fourth Directive into national legislation represented an important step towards reducing the main accounting differences between EU members. However, as this directive on common accounting rules aimed only to establish minimal declaration procedures and did not intend to harmonize national assessment practices, accounting differences still exist. In order to reduce these, efforts were made to develop a comprehensive harmonized indicator concept based on the methodology adopted in the BACH³ database. It was possible to take the harmonization further insofar as the comparison was only between two countries.

³ BACH (Bank for the Accounts of Companies Harmonized) is a database containing aggregated and harmonized accounting data of non-financial firms from 11 European countries and Japan and the United States.

1.1. Accounting Discrepancies Which Have Been Completely Eliminated

The disclosure of debtors and creditors

While the French "Plan comptable general" (PCG) requires assets and liabilities to be disclosed according to the nature of the underlying transaction, the German HGB ("Handelsgesetzbuch"), in accordance with the Fourth EC Directive, prescribes a classification according to the degree of financial integration. In Germany, trade debtors or creditors⁴ to group and associated companies, for example, have to be recorded under creditors and debtors to group and associated companies and not under trade creditors or debtors. This significant difference clearly constitutes a major potential for over-estimating the extent of trade debtors and creditors in France relative to Germany. Thanks to supplementary information on this item available in the CdB database, it was possible to readjust the balance sheet data of French companies. In order to achieve identical disclosure of the respective items, the components of trade debtors and trade creditors, other debtors and other creditors, other financial creditors and conditional loans and advances relating to groups and associated companies were reclassified into the respective items of debtors and creditors to group and associated companies, which appear in the harmonized layout as one single position.

According to the weighted mean, the newly created ratio of amounts owed by group and associated companies comes to a share of 10% of the balance sheet total while, as a counterpart, trade debtors fall from 24% to 19% and the item "other debtors" decreases from 9% to 4%. The effects on the liability structure are even larger. After the adjustment measures, an overall group and associated companies ratio of 12% is recorded and the related reductions in commercial creditors, other financial creditors and other creditors amount to 3%, roughly 8% and 1%, respectively.

The format of the annual accounts with respect to profit appropriation

Whereas the financial statements of French corporations are generally shown before profit appropriation under a sub-item of own funds, the annual accounts of German incorporated enterprises are always shown after the at least partial appropriation of profits, since for some enterprises there are legal or statutory requirements to appropriate profits immediately on the balance sheet date. German enterprises only disclose the retained part of the profit for the year, under the heading of own funds. The profit to be distributed (dividends) is shown under borrowed funds.

In order to analyze trends in German companies' own funds whatever the distribution policy adopted, all the annual accounts in the Bundesbank database include the complete profit for the financial year before profit and loss transfers.

⁴ It should be noted that creditors relate to the liabilities side (payables) and debtors to the assets side (receivables) of the balance sheet.

The disclosure of special tax-based reserves

Under German regulations, the treatment of special tax depreciation facilities and untaxed reserves has an effect on own funds. Such reserves for which tax is to be paid only when they are released have to be shown under special reserves. Like special tax depreciation facilities, they have a dual character (partly capital, partly provisions for deferred taxes), which is why in Germany 50% of the special reserves are included under own funds and 50% under borrowed funds for the purposes of financial analysis. In order to increase the comparability of the data, the total amount of this type of reserves was allocated to a special sub-item of own funds.

1.2. Avoidable Accounting Discrepancies***The differentiation of other debtors and creditors***

By analogy with the measures taken to adjust debtors and creditors to group and associated companies, only one residual item was set up for other creditors and other debtors, comprising both financial and non-financial components of creditors and debtors.

The disclosure of financial assets

The standard layout for the balance sheet according to the French accounting plan does not distinguish between participations and shares in affiliated enterprises (holdings that exceed 50% of the nominal capital of the investee). Conversely, participating interests and shares in affiliated enterprises are shown under two separate items in Germany. This problem is solved by summing both sub-items in the German accounts into one position.

The definitions of participations diverge: the holdings must exceed 10% of the capital of the investee in France and 20% in Germany. The distinction between participations and other long-term investments is distorted, with the result that the degree of financial interlinking between companies is systematically understated in German accounts in comparison with their French counterparts. By focusing on the total financial assets position, these differences are removed.

1.3. Insoluble Accounting Discrepancies***Differences in the disclosure and valuation of provisions***

Whereas in France the OECCA ("Ordre des experts comptables et des comptables agréés") defines clear-cut rules for determining the amount to be provisioned, German regulations leave more room for discretionary latitude by firms. In addition, provisions for liabilities to third parties are generally mandatory in Germany, which is not the case in France. This obligation concerns such items as provisions for pensions. In Germany, company pension entitlements usually represent direct obligations of the employer.

Differences in the valuation of fixed assets and stocks

The German regulations provide considerable options for the inclusion of additional cost elements (administration costs, overhead costs related to depreciation of fixed assets and interest on loans). The corresponding French regulations are much more restrictive.

Differences in accounting for intangibles

The capitalization of R&D expenditures is forbidden in Germany, whereas in France expenditures relating to a separately identifiable project with realistic expectations of commercial success can be capitalized as intangible fixed assets and amortized over a maximum period of 5 years.

The treatment of leasing

As a rule and according to the methodology adopted in the BACH database, French financial statements disclose finance-leased assets within the balance sheet of the lessor until a purchase option is exercised, while in German accounts-where the lessee is regarded as the economic owner-these properties have to be recorded as an asset for the lessee, who capitalizes it at acquisition cost and compensates for that amount with a liability corresponding to the outstanding instalment payments.

Accounting for grants and subsidies

In Germany, subsidies and grants, to the extent that they are not repayable, must either be deducted from the purchase price or be shown on the liabilities side in a separate item, in accordance with the recommendations of the Central Committee of the Institute of Auditors. Direct entry under income is considered appropriate in exceptional cases only.

French accounting legislation, however, offers enterprises an option for investment grants, which can be shown either as a direct entry under extraordinary income, or in a separate capital sub-item that serves mainly to spread the associated income over a longer period.

2. Financing Sources: Significant Differences between Countries

The principal objective of the descriptive analysis is to provide a comprehensive description of the financing sources used by French and German incorporated companies to cover their financing needs emerging from the asset conversion cycle.

- Within such an empirical framework, several important questions emerge:
- What are the country-specific features of corporate finance in France and Germany?
- How do corporate finance structures in Germany and France typically differ and how did they develop during the eighties and the nineties?
- What are the main reasons for the observed differences in corporate finance?
- Can the different theories of corporate finance provide relevant explanations?
- And finally, to what extent do these differences reflect basic features of the national institutional framework in general and of the national system of corporate finance in particular?

2.1. Structures of Corporate Financing: Change in France/Stability in Germany

The corporate finance systems in France and Germany differ considerably regarding the main financing sources of companies, namely own funds, debts and provisions for risks and charges. Three general characteristics are of particular significance when the weighted means of the respective ratios are analyzed.

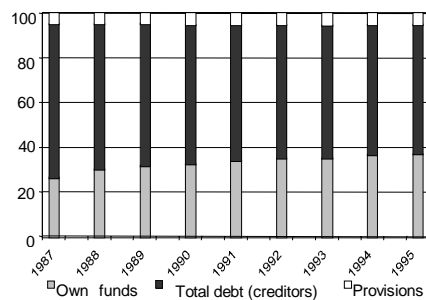
- The financing activities of German manufacturing corporations tend to be based in almost similar proportions on each of the three sources of company finance, whereas their French counterparts only concentrate on own funds and borrowed funds. Provisions play a less significant role in the annual accounts of French corporations and, as a result, total indebtedness amounts to approximately twice that of German companies.

Liability Structure

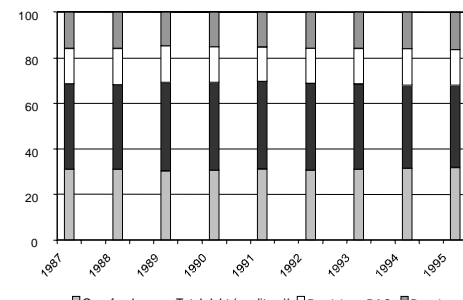
France

Germany

Weighted average (%)



Weighted average (%)



Sources: Banque de France, Bundesbank

Data: March 1998

- Despite the marked slackening of business activity in the first half of the nineties in both countries, the principal financing patterns of west German incorporated enterprises remained more or less stable, whereas French corporations actually improved their financial situation considerably at the end of the eighties and in the first half of the nineties by significantly raising their level of own funds.
- Looking at size-specific financing patterns (see Figure 2), it becomes immediately apparent that the financial structures of French corporations tend to be much more homogeneous than is the case for west German businesses, as the graduation by company size is far less significant in France than in Germany.

2.1.1. Growth of Own Funds in France

In contrast to Germany where the equity ratio ⁵ for all manufacturing enterprises remained relatively stable at 31% in the period considered, the share of own funds in the balance sheet total of French corporations displays robust growth, the ratio rising from 26% in 1987 to 37% in 1995. The increase was particularly pronounced during the acceleration in the economic recovery at the end of the eighties and it continued at a slower pace after 1993.

⁵ Weighted mean

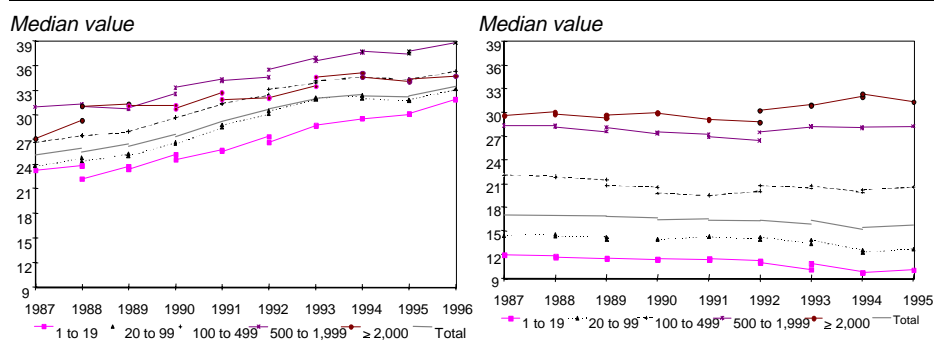
If the median figures are considered, the level of capitalization of French enterprises increased from 25% to 32%, whereas it remained stable and represented 16% of the liabilities of German manufacturing firms.

Net equity as a percentage of the balance sheet total

By size class

France

Germany



Sources: Banque de France, Bundesbank

Data: March 1998

As the solvency of French companies depends on their reputation and especially their net equity, the role played by own funds differs from one country to the other. In addition, the breaking down into five size classes shows the diverging behaviour of manufacturing firms. French manufacturing firms are relatively homogeneously equipped with own funds with respect to firm size, whereas in Germany the respective own funds differential amounts to more than 20 percentage points. The largest German enterprises had approximately three times more equity capital than firms with less than 100 employees.

With a median equity ratio of 10% in 1995, very small German enterprises only have one third of the amount of their French counterparts: this ratio is 12.7% for firms with between 20 and 99 employees and 20.5% for firms with between 100 and 499 employees in Germany, against respectively 31.7% and 34.3% in France. The financial autonomy of the smallest German enterprises slackens between 1987 and 1995, whereas it improves for large enterprises. To conclude, an increasing trend towards a marked polarization of the financial structures in German manufacturing can be distinguished, whereas French companies, irrespective of their size, have continuously increased their own funds.

The equity levels of companies in the two countries has been strongly influenced by the country-specific differences in the taxation of internal and external financing.

In France, the tax burden on corporations was significantly reduced in several steps from 50% in 1987 to 33.33% in 1993⁶, thus creating a wide spread (more than 20 percentage points between 1991 and 1995) between the top rate of personal income tax of 56.8% and the profit retention rate. In addition, from 1989 to 1992, the retention rate fell to 34% while the distribution rate remained unchanged at 42%, causing an increase in reserves. These special French tax regulations provided conditions propitious for the improvement of the capital structure of French firms. In contrast, in Germany, retained earnings are more heavily taxed than distributed profits. The standard tax rate applied to retained earnings was reduced from 56% in 1987 to 50% in 1990 and 1993.

⁶ From 1995 onwards, a special contribution of 10% and later 15% was enforced on larger businesses and a reduction to 19% was introduced for small businesses with turnover of less than FRF 50 million.

This rate is currently 45% plus a 3.38% solidarity surcharge. If the corporate profits are distributed, the standard corporation tax rate of 45% is reduced to 35%.

In Germany, the respective reductions in corporation tax rates were introduced later (1990) and the tax retention rate, at 45%, constantly exceeded the French level of 73%. As a consequence, the spread between the retention rate and the top rate of income tax was much less pronounced and therefore, unlike in France, did not provide strong incentives for German businesses to improve their capital structures.

2.1.2. Country-Specific Patterns of Indebtedness

In Germany, debt levels contrast sharply according to firm size. The median of the total creditors/total liabilities ratio varies from 30% for the largest companies to approximately 80% for the smallest corporations, whereas the respective ratios for the French LTEs⁷ and STEs⁸ only display a spread of roughly 10 percentage points. In addition, French corporations show a continuous trend towards a reduction of their debt burden during the nineties. In contrast to the situation in France, the financial situation of German manufacturing enterprises differs greatly by firm size, and this difference from the situation in France became even more pronounced during the review period.

The overall trend towards a steady reduction of bank debt (as a percentage of the balance sheet total) was confirmed for French corporations of all sizes. SMEs had greater recourse to bank debt, their share in the balance sheet total amounting to approximately 10% as against 2-3% in larger enterprises, which are able to raise funds on the capital markets. The latter have the same low bank debt ratio as their German counterparts.

For the largest businesses (with more than 2,000 employees), bank dependence is actually more or less non-existent, as their share of bank debt in the balance sheet total did not exceed 2.5% (weighted mean) and 1.5% (median) at the end of the period. By contrast, German SMEs are heavily dependent on banks: during the period, the value of the median increased from 19% to 23.5% for the bank debt/total liabilities ratio in firms with between 20 and 100 employees.

In the segment of German small- and medium-sized enterprises, the conventional bank loan still represents the classical instrument for financing capital formation and working investment. This fact confirms their bank dependence.

⁷ LTEs: enterprises with more than 2,000 employees

⁸ STEs: enterprises with fewer than 20 employees

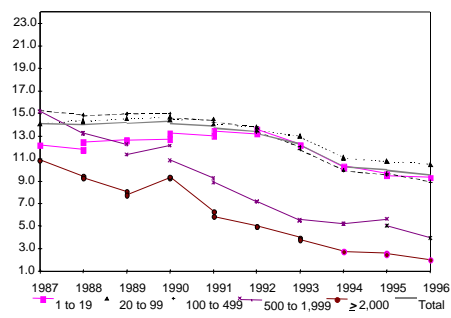
Bank debt as a percentage of the balance sheet total

By size class

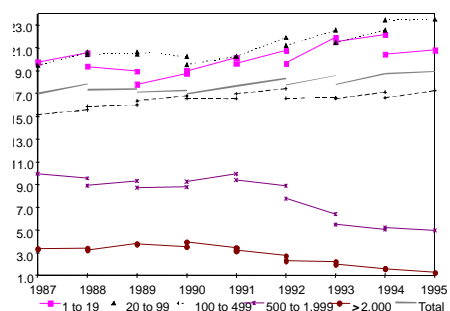
France

Germany

Median value



Median value



Sources: Banque de France, Bundesbank

Data: March 1998

The debt behaviour of German companies is determined by legal regulations. The requirements of creditors are taken into consideration by German bankruptcy and property law, the latter of which permits the broad use of balance sheet assets to cover credit risks. Owing to these extensive and flexible options, it is quite common in Germany for the total amount of accounts receivable or the entirety of an enterprise's tangible fixed assets to be assigned to a bank, by way of a general assignment. In the case of a few SMEs, 70-80% of the operating assets may thus be mobilized for the purpose of collateralizing banks loans.

Certain categories of creditors in Germany, notably banks, enjoy extensive protection against bad debt losses in the event of bankruptcy. By making use of the provisions of current bankruptcy legislation, they can limit their default risk to a large extent by establishing liens against real property and movable goods. In France a comparable protection from bad debt losses in the event of bankruptcy is not as common. French restructuring insolvency procedures are primarily oriented towards the rescue of the enterprise, which results in the "freezing" of creditor rights so as to prevent the premature destruction of the insolvent party's estate. For the eventuality of liquidation, the ranking of creditors was defined differently in the amendment of the Act adopted in 1994. The satisfaction of secured creditors (i.e. creditors holding claims secured by real property, movable goods or liens against production facilities and machinery) takes precedence, but their claims are nevertheless ranked below those of employees. Finally, French banks run a greater risk of showing bad losses than their German counterparts.

In addition, the Hausbank principle, which is based on close relations and continuous cooperation between a firm and a particular bank, fosters the extension of credit to SMEs. Most German SMEs give priority in their business activities to one bank, which runs the core of their banking transactions and which, for its part, provides a long-term commitment to its "Hausbank" customers. This close and stable working relationship establishes a climate of confidence and cooperation between the companies and banks involved. Such a relationship lowers the existing information asymmetries between lenders and borrowers, and ensures better monitoring by the bank, enabling a substantial reduction of the credit risk for the banks involved. The Hausbank ensures easy and flexible access to short-term loans. It encourages long-term finance and thus facilitates reorganization and growth of the company. In the event of financial distress,

it plays an active role in keeping the business running by strengthening equity, cancelling or restructuring debts or extending new loans. It can also have an influence on the company's decision-making process and investment policy.

The structure of bank debt in the two countries displays essential differences. Short-term bank lending appears to be particularly low in France, while the reverse is to be found in Germany. In addition, an inverse relationship between the two countries is seen when looking at the hierarchy of bank debt according to firm size and maturity.

Short-term lending is a main source of financing for German SMEs, whereas it remained constantly of minor importance in French SMEs. One quarter of small German businesses and of French corporations with less than 100 employees do not rely on short-term lending. The median value of the short-term bank lending/total liabilities ratio is 10% in German firms with less than 100 employees, against 1% in their French counterparts. A wide dispersion can be seen in Germany.

Conversely, the larger enterprises have more recourse to short-term bank borrowing than their German counterparts: in 1995, the value of the median was respectively 1.5% and 0.5%.

In France, enterprises and their customers make extensive use of trade credit. In Germany, however, the granting of cash discounts (price reductions of 2-3%) makes cash payments particularly attractive. Trade creditors play an important role in the French corporate finance system by performing the function of a short-term financing buffer, whereas this role is played by short-term bank loans in Germany.

The procurement of borrowed funds via group or holding companies is an alternative financing source for corporations. Group borrowing increased at a sustained pace in Germany, with the median of the loans from group and associated companies/total liabilities ratio doubling, whereas it remained more or less stable in France, except in the case of firms with more than 2,000 employees.

2.1.3. The Role of Provisions in Germany

Another distinguishing feature of corporate finance in the two countries is the differing importance of provisions for risks and charges as a method of corporate financing.

Both the weighted mean and the median of the provisions/balance sheet total ratio indicate that these funds are of particular importance for the financing of German firms, notably the larger ones, whereas they generally only play a marginal role for French businesses.

For Germany, the weighted mean figures indicate a share of provisions in the balance sheet total of 30%, compared with 5% in French firms. The ratio is greater than 12% in half of German firms, whereas it is zero for 50% of French firms.

The high value of the weighted mean compared to the median reflects the considerable concentration of provisions in the LTE segment. In half of these enterprises, they exceed 31% owing to the large amount of provisions for pension liabilities, whereas provisions for pensions are small (0-5%) in half of the SMEs. The dispersions according to size in the German figures seem to reflect differences seen in the methods for setting up provisions for risk and charges. Among the company-based schemes, which are designed to supplement the compulsory state pension insurance system, schemes operated directly by the employer are the most widespread.

Through its direct pension commitment, the firm enters into a contractual pledge to provide a promised pension benefit to the beneficiary as soon as that benefit falls due, which is normally the case when the employee reaches the statutory retirement age. Through the commitment undertaken by his enterprise, the employee obtains a claim on his employer. In accordance with the Fourth EC Directive, the firm must therefore set up pension provisions enabling it to honour its debt when the employee retires. The amount of the pension provisions is calculated as the actuarially-computed present value of the pension benefits promised by the enterprise. The present value of future pension payments is accumulated in the form of equal annual premia from the day the employee joins the firm up to the day he leaves, and the amount that has already accumulated is discounted using the imputed rate of interest.

Pension provisions computed on the basis of the currently valid (for tax purposes) imputed interest rate (6%) constitute a tax-deductible expense and so correspondingly reduce the assessment base for income tax, corporation tax and trade earnings tax. Hence, pension provisions allow enterprises to internally accumulate amounts destined for expenditure long before they become due and thereby reduce the stated profit, at the same time allowing the accumulated resources to be used freely by the enterprise over the long-term as an internally generated cash flow (financing effect through reinvestment of the funds within the enterprise).

Lastly, in very large German firms, provisions for risks and charges, including pension provisions, constitute a source of financing of similar importance to own funds and total debt.

2.2. A Growing Part of Financial Investments

As mentioned, a comparison of the financing structures would remain particularly rudimentary if the differences in the asset structures were omitted. The financing behaviour of companies notably depends on their respective financing needs arising from the asset conversion cycle.

In contrast to the sharp differences between the liability structures of manufacturing enterprises' in Germany and France, the structural differences seen for fixed and current assets are much less pronounced.

In general, it may be assumed that the long-term trend in tangibles reflects not only the uncertain investor expectations at the end of the period, but also to some extent the growing tendency towards external growth. Large corporations in particular placed greater emphasis on the acquisition of investments and participating interests. It would seem that, in the first half of the nineties, a large proportion of manufacturing enterprises decided to channel a major part of their cash flow into the acquisition of financial assets, especially participating interests, rather than investing in new tangible fixed assets.

This external growth strategy, which reflects the intensified globalization efforts and the growing trend towards outsourcing, was particularly pronounced in the case of LTEs, whose financial fixed assets ratio increased sharply from 6% in 1987 to 14% in 1995 in France, and from 7% to about 16% in Germany.

This trend resulted almost exclusively from a substantial rise in shares and participating interests, which doubled over the period under review. By contrast, financial assets also grew for businesses in the size class of 500 to 1,999 employees, but only at a very moderate pace of approximately 2% in both France and Germany.

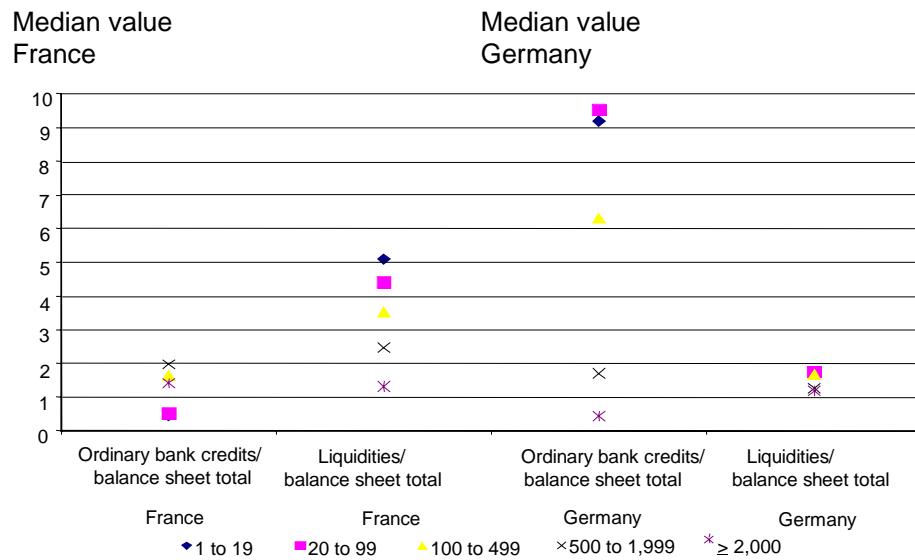
As far as current assets are concerned, the signs of advanced concentration and closer cross-shareholdings in the French and German manufacturing sectors are reflected in an increase in the debtors to group and associated companies/total assets ratio.

As expected, the funds required for inter-group financing were almost exclusively provided by larger businesses in the two upper size classes (500 employees and more). This kind of globalized financial strategy appears to be primarily a characteristic of large groups and holdings providing finance to their subsidiaries.

As described in the previous section on trade creditors, the financial burden on French manufacturing firms resulting from trade credit granted to customers was far heavier than on their German counterparts.

If liquidities—both current investment and cash in hand—are measured in relation to the balance sheet total, a subtle but nevertheless important difference becomes evident in the respective financing structures of French and German manufacturing firms. There is nothing to suggest that this parameter of 'corporate financial strategy played a significant role for German manufacturing corporations, as on average a liquidity ratio of barely 2% was recorded. But in clear contrast with Germany, the larger and relatively stable share of liquidities in the balance sheet of French SMEs (around 5%) provides some evidence of a liquidity hoarding strategy.

Financial flexibility in 1995



Sources: Banque de France, Bundesbank

Data: March 1998

These country-specific findings for liquidities are in line with the respective results for bank borrowing found in this study. For smaller German businesses, it would appear plausible that, owing to their flexible access to bank loans in the form of standing facilities or general operating loans, there is no need to accumulate considerable amounts of cash and current investment in their balance sheets. Quite the opposite tends to be true for their French counterparts, which consistently displayed a very low median proportion of short-term bank loans in their balance sheets. It is logical to assume either that this lower recourse to short-term bank debt is due to the existence of cash, or—an answer that would appear more convincing—that the difficulty in obtaining liquidity from banks (in the form of short-term bank credit) forces this company size segment to hold cash in order to meet their need for financial flexibility.

The results of the descriptive approach clearly show that corporate capital structures contrast significantly, as the different sources of corporate finance tend to play very distinct roles in the industrial sectors of the two countries. Thus, the respective systems of corporate finance seem to differ clearly and systematically. The main differences are:

- completely different levels of own funds: the size effect is more accentuated in Germany, the growth of equity stronger in France;
- considerable amounts of provisions accumulated by the larger German corporations;
- significant differences in access to bank loans and a reverse structure of short versus long-term components, indicating that French banks are more engaged in investment-related financing activities, whereas German banks primarily tend to cover working capital requirements;
- substantial divergences in the amount of liquidities carried in the balance sheet, resulting from different strategies for ensuring financial flexibility;
- and, finally, significant differences in inventory levels.

As far as Germany is concerned, the findings clearly show that the corporate finance system is divided into a SME sector and a large enterprise sector. These sectors tend to differ fundamentally as regards access to financing sources, the intensity of their use and substitution processes between different financing techniques.

The financing system adopted by German SMEs could be described as the traditional bank-based model, as a high degree of leverage and bank intermediation are observed, coupled with a very low accumulation of own funds.

The financing structures of the large enterprise segment in Germany is characterized by a high degree of financial autonomy. Neither extensive capital market reliance nor a high dependence on bank credit can be observed for these enterprises. The largest companies have been able to almost completely decouple themselves from the lending activities of the banking sector. These businesses have been able to create a kind of internal capital market, which almost entirely provides the necessary funds for the financing of their operating cycle by accumulating comparatively high levels of equity capital and reserves and, even more importantly, a substantial amount of provisions, which tend to be at least as extensive as own funds.

While the French SME sector continuously improved its provision with own funds during the period under review, the manufacturing sector as a whole shows considerable homogeneity of financing structures, unlike in Germany.

Furthermore, the data permit the conclusion that the degree of bank dependence appears to be considerably lower for SMEs in France than in Germany. Nevertheless, the process of disintermediation from the banking system is more widespread, but far less pronounced than is the case for large German corporations.

It may therefore be concluded that the French model of corporate finance has developed in the past from a heavily bank-intermediated system towards a more Anglo-Saxon type capital market-based model with financing from capital markets.

The results of this study demonstrate that the most important financing sources for French incorporated enterprises are to be found in equity, notably the accumulation of reserves and trade credit from suppliers, which both tend to provide some of the financial flexibility necessary in the asset conversion cycle. But, as in Germany, the borrowing channel based on lending relationships with suppliers is more than offset by credit granted to customers.

In general, the findings of this study tend to suggest that the differences in France and Germany's corporate finance systems can be linked to a great extent with the institutional environments of the two countries. A very prominent factor is the relationship between banks and companies.

3. The Determinants of Borrowing Behaviour

The aim of the econometric analysis is to test, for French and German firms, the main hypotheses drawn from the theoretical body of literature on the determinants of capital structure. Identical debt equations are estimated for 2,899 French and 1,275 German firms for which data were available over the 1987-95 period, with special care being taken to harmonize data and variables. The two balanced samples are quite sizeable: they do not just concentrate on large or listed firms, but also contain small- and medium-sized firms. To be able to estimate a dynamic model with firm fixed effects, thus taking into account unobservable firm characteristics, the General Method of Moments (GMM) is applied. The model is estimated not only for the two total samples, but also by size class, thus enabling any different behaviour according to firm size to be distinguished.

3.1. Overview of the Alternative Hypotheses

Given the assumption of perfect financial markets, the well-known irrelevance theorem of Modigliani and Miller should hold, i.e. the capital structure is arbitrary and there are no explanatory variables. However, if imperfections, such as bankruptcy costs or asymmetric information, are admitted, the question of the 'driving factors' of corporate debt immediately arises.

The empirical literature on the determinants of corporate debt can be described the following way. There is not one theoretical model, with a clear derivation of the explanatory variables, but rather a succession of alternative hypotheses pertaining to different capital structure theories: cost of access theory, pecking order theory, signalling cost theory and asymmetric information, role of taxes, bankruptcy and agency costs.

This leads to a long list of potential determinants of firms' debt, whose signs vary from one theory to the other. The estimation of the equation allows for the validation or the rejection of the different theories. We summarize here the alternative hypotheses proposed by the literature and focus on the determinants for which data are available for both countries.

Firm size: two possible interpretations of the size effect can be distinguished. On the one hand, larger firms may have easier access to capital markets due to reduced asymmetric information. This would suggest a negative correlation between size and

level of leverage. On the other hand, banks might have more incentive to restrict smaller customers at first as a result of this asymmetry, when deciding to cut down loans. In this case, a positive relationship is to be expected between size and variation of leverage.

Growth of enterprises: faster growth may intensify the need for more external finance, implying a positive correlation. But, conversely, dynamic internal growth may increase agency costs because such firms are difficult to control. Leverage should therefore decrease.

Collateral: if there is an asymmetric distribution of information between firms and banks, the agency costs of the creditor (bank) can be reduced by the firm sending the necessary signals. Collateral may serve as such a signal, which diminishes the danger of moral hazard. Therefore, the supply of bank credit and the value of the collateral should be positively correlated.

Firm value and profitability: on the one hand, a firm's high value provides a potential lender with a high degree of collateral and therefore with a higher probability of debt repayment, leading to a positive correlation. Another approach is based on asymmetric information and the pecking order theory. Firms finance their needs in a hierarchical fashion. Firms will prefer to raise funds through retained earnings rather than through debt and equity (issuing new shares). In light of these considerations, a negative relationship between profit and the level of borrowing could be expected. It has also been argued that the pecking order hypothesis could be more relevant for small firms, since their relative cost of debt and/or external equity may be higher.

Risk of return: given the agency and bankruptcy costs that have to be taken into account by banks as creditors, a higher volatility of earnings (usually employed as a measure of risk) might lead to a higher probability of default. Therefore, a negative correlation between leverage and risk can be expected and, in general, an unfavourable financial status may have a negative impact on the debt ratio. Contrary to this traditional approach, arguments can be found suggesting that the impact of risk on debt may be positive. More risky firms seem to be less subject to the problem of underinvestment; agency costs may therefore be reduced, and this reduction may possibly outweigh the increase in the probability of bankruptcy. In addition, it can be argued that this correlation is very sensitive to firm size. Creditors may have the tendency or the obligation to continue lending to risky firms in the hope of avoiding bankruptcy and this can be particularly the case for large firms. Furthermore, a positive relationship of risk and leverage may result from the firms' need for 'distress' borrowing during an economic recession when the risk position is usually worsening.

Cost of finance: this variable, which seems an important determinant of a firm's debt, is surprisingly not mentioned by the empirical literature. The idea is that an increase makes external funds more expensive, thereby causing a firm to prefer to finance new projects with own funds.

Due to the unavailability of information for one or both countries, we are not able to directly include variables taking into account the banking system, taxes, R&D expenditures, structure of ownership and legal form. However, as we will see later, it has to be borne in mind that some of these determinants do not vary a great deal over time and will be taken into consideration indirectly through the introduction of fixed effects, also known as unobservable firm characteristics (banking, structure of ownership, legal form). Other variables, such as taxes, may partially be macro variables, which could explain the significance of year dummies in the estimated model.

Definition of the variables and data sets for the econometric analysis

Left-hand side variable

The debt ratio is defined as broadly as possible. The numerator corresponds to short-term plus long-term creditors without provisions (including commercial creditors, i.e. trade credit). The denominator is the balance sheet total minus unpaid capital, i.e. total assets. Some empirical studies contain more restrictive definitions of debt, for example bank credit. Such a procedure raises the question whether bank credit and other debt components may be substitutes. This issue, which seems to be of special interest for monetary policy, is beyond the scope of this paper.

Explanatory variables

- *The dynamic growth of the firm has been included either through the growth of the balance sheet total, turnover growth or the investment ratio defined as the variation of tangible fixed assets relative to turnover.*
- *The collateral of a firm is proxied by the sum of tangible fixed assets plus stocks divided by the balance sheet total.*
- *Several definitions of profit are possible. Taking into account the availability of information in both countries, net profit to total assets, interpreted as return on investment has been used.*
- *Risk relating to a firm's profitability is measured by the squared relative difference between the firm-specific profit (net profit/turnover) and the average profit of all available firms.*
- *The cost of finance variable is defined as interest expenditure divided by financial creditors (i.e. excluding commercial creditors from debt) and may be interpreted as a firm-specific interest rate.*

Construction of the trimmed and balanced samples

Firms with zero employment or negative own funds have been excluded. Then, firms with observations outside the interquartile range, plus or minus five times this interquartile range, were discarded for the following ratios: net investment in tangibles to net turnover, cash flow to net turnover, net profit to total assets, interest paid to financial creditors and the risk variable. For growth rate variables (total balance sheet, turnover, tangible assets and the investment ratio), the same selection rules have been used for both countries after checking the distribution. The estimates are based on balanced samples, i.e. firms with data for each year over the 1987-1995 period. The need to estimate the model in first differences, in order to take into account unobservable firm effects, and to then use lagged variables as instruments, requires firms to be in the sample several years in a row. The data sets respectively contain 2,899 French firms and 1,275 German firms.

Variance analysis and the econometric model

Firms' data are a combination of cross-section information over several years. Classical pooling based on the OLS procedure assumes that all parameters are identical for all firms, neglecting inherent firm heterogeneity and therefore giving potentially biased estimates. Appropriate tests show that fixed effects models provide a better fit than classical pooling. These models explicitly take the differences between firms into account.

Analysis of variance

The variance analysis decomposition for the two countries uses a simple static model with year and size dummies and no firm dummies. This is a simple way to formalize the descriptive statistics reported above. The model is based on the following specification:

$$y_{it} = \beta_1 x_{1it} + \beta_2 x_{2it} + \beta_3 x_{3it} + \beta_4 x_{4it} + \beta_5 x_{5it} + \alpha_j + \lambda_t + \varepsilon_{it}$$

$$i = 1, \dots, N, \quad j = 0 \text{ à } 5 \text{ et } t = 1, \dots, T$$

where

- y_{it} is the endogenous variable, in this case the debt ratio for firm i and year t
- x_{1it}, \dots, x_{5it} are the exogenous right-hand side variables defined above: growth of total assets or turnover growth, collateral, i.e. tangible fixed assets plus stocks divided by total assets, profit as a percentage of total assets, cost of finance and the risk measure.

The error term u_{it} is made up of three components:

- a size effect α_j which is a dummy equivalent for each firm belonging to the same size class j ,
- a year effect λ_t ,
- ε_{it} the remainder (where the usual assumptions apply).

This analysis enables the measurement of the contribution of each explanatory variable to the total variance of a variable, i.e. the explained variance; it is used here to determine the impact of size and time on the firm's debt level.

Dynamic specification of the debt function

To estimate the coefficients of the microeconomic determinants while eliminating the firm fixed effects, we have chosen a dynamic model, in first differences, specified as follows:

$$y_{it} = \beta_0 y_{it-1} + \beta_1 x_{1it} + \beta_2 x_{2it} + \beta_3 x_{3it} + \beta_4 x_{4it} + \beta_5 x_{5it} + \varepsilon_{it}$$

$$i = 1, \dots, N \text{ et } t = 1, \dots, T$$

The introduction of the lagged dependent variable raises the issue of the simultaneity of the residual and the lagged variable. Therefore, we use the GMM technique, which takes into account the problem of the endogeneity of regressors, but also enables checks for heteroscedasticity across firms, correlation of errors over time, simultaneity and measurement errors. The instruments used are the lagged levels of the dependent variable as well as other explanatory variables. Several models are tested to determine the choice of the adequate instruments (number of lags and hypotheses on the explanatory variables considered as endogenous to the model and therefore also being instrumented).

The first model, called "exogenous", assumes that all right-hand side regressors are exogenous and measured without errors. Only the lagged debt variable (in first differences) is instrumented by the debt variable in levels, lagged $t-3$ and $t-4$. This is a rather controversial hypothesis. Two other possibilities are also tested. In order to take into account overall simultaneity and the potential existence of measurement errors, all right-hand side regressors are assumed to be endogenous and therefore instrumented ("endogenous model"). Another possibility is that only the "collateral" and the "risk" variables are concerned with simultaneity issues and/or with measurement errors and should to be instrumented ("mixed" model).

3.2. Empirical Results

Before presenting the econometric results, some characteristics of the model's explained variable, i.e. the debt ratio, and of its microeconomic determinants are summarized. The following table shows unweighted mean values for 1995 of most variables used in the econometric analysis, without distinction by size class. The trend in the selected variables is given in the following charts.

Descriptive statistics in 1995 – Balanced and trimmed data sets

	France – 2,899 firms			Germany – 1,275 firms		
	Mean (Standard error of the mean)	Min.	Max.	Mean (Standard error of the mean)	Min.	Max.
Total debt/total assets	59.14 (0.31)	8.7	98.6	56.81 (0.59)	4.9	98.4
Growth rate of total assets	5.74 (0.27)	-44.2	113.0	6.34 (0.50)	-59.8	187.5
Growth rate of turnover	6.89 (0.29)	-58.6	160.9	7.35 (0.43)	-50.3	126.0
Investment ratio	0.26 (0.05)	-16.2	17.3	0.19 (0.11)	-11.7	70.0
Collateral	42.11 (0.29)	0.3	93.0	55.66 (0.47)	3.4	98.9
Profit	3.29 (0.08)	-19.5	23.2	2.66 (0.14)	-16.2	26.4
Cost of finance	6.68 (0.08)	0	32.8	6.50 (0.09)	0	30.6
Measure of risk	1.65 (0.06)	0	20.5	2.22 (0.10)	0	19.8
Number of employees	222 (20.2)	1	41,635	829 (176.1)	3	167,200

NB: Unweighted means for the balanced and trimmed data sets, as a percentage unless otherwise indicated.

See box for the definitions.

Sources: Banque de France, Bundesbank

Data: March 1998

The striking result is that the two countries have very different average debt ratio behaviours over time, but very similar microeconomic determinants.

- The average French debt ratio (expressed as an unweighted mean) decreased by almost 10 points over the eight-year period considered, whereas in Germany this ratio seems to be relatively stable, which is consistent with the macroeconomic trends described in the first part of this paper.
- However, the growth rate of total assets, the turnover growth rate, the profit variable and the risk variable follow the same business cycles in both countries and are more volatile over time than the debt ratios.

The trends in two other variables should be noted in particular.

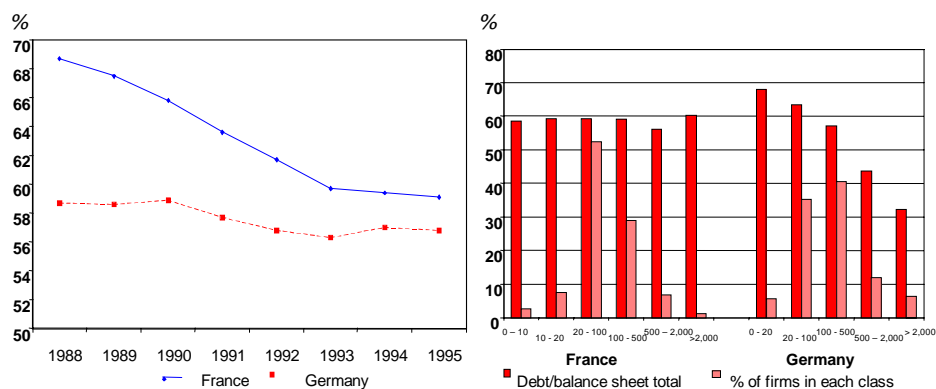
- German firms are almost four times larger than French firms: average employment is 829 compared to 222. This result is due to the average size of firms with over 2,000 employees in Germany (around 10,000, compared to 5,500 in France) and to the fact that the German sample contains relatively more "large firms".

- The computed interest rate, calculated using balance sheet data only and representing the cost of finance, closely follows the upward and downward movements of market rates in Germany and France.

Debt to total assets

All size classes combined

By size class in 1995



NB: Unweighted means for the balanced and trimmed data sets, as a percentage unless otherwise indicated.
See box for the definitions.

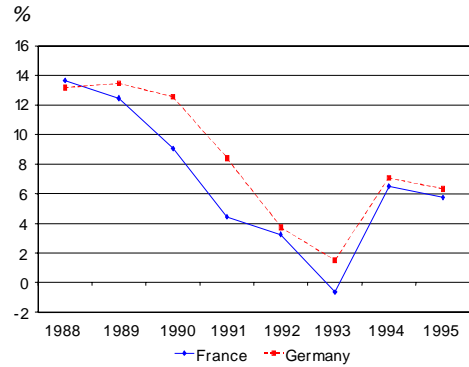
Sources: Banque de France, Bundesbank

Data: March 1998

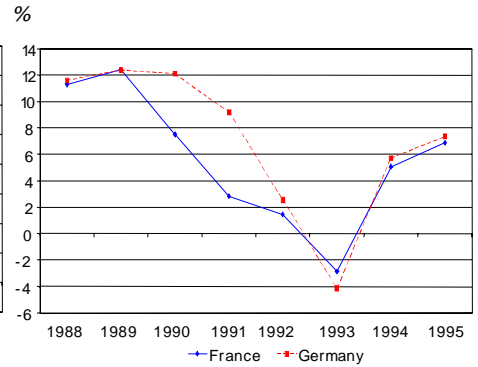
Size could thus be an explanatory variable in Germany, whereas in France, the marked decrease in the debt ratio over time for all size categories is the main observation. These results are confirmed by the variance analysis of the debt ratio (see box). The decomposition shows that the time dimension plays a significant role in France (3.7%, i.e. 14% of the explained variance), while it is almost non-existent in Germany (0.2%). Size, however, shows a very small contribution to the model in France (0.3%), while it is essential in Germany (16.9%) and represents roughly half of the explained variance. Conversely, among the explanatory variables, the hierarchy is the same for both countries: profit has by far the largest contribution, followed by collateral and cost of finance, and finally the growth variables and the risk proxy.

Evolutions of the main microeconomic determinants

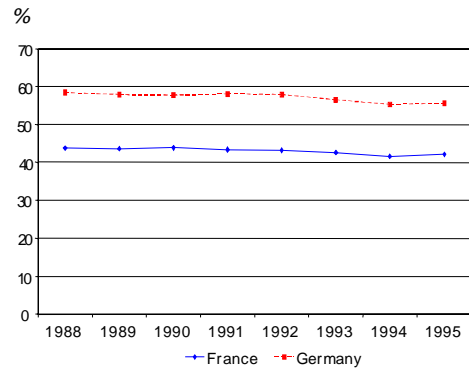
Growth rate of total assets



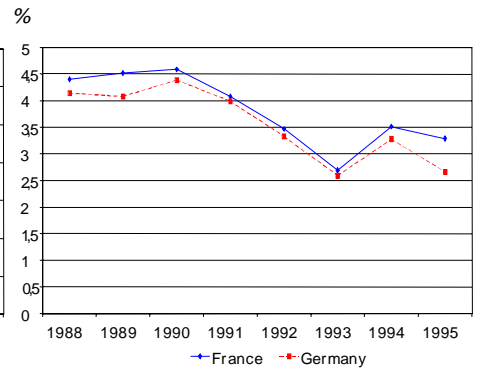
Growth rate of turnover



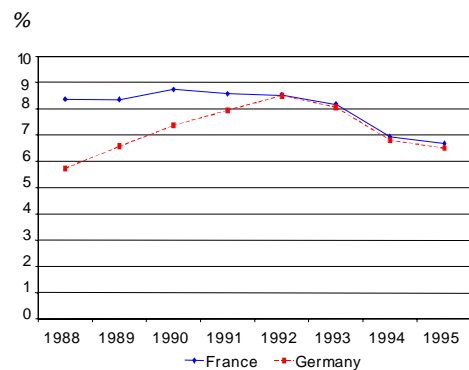
Collateral



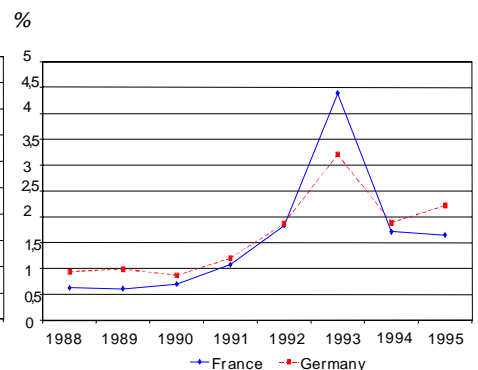
Profit



Cost of finance



Measure of risk



NB: Unweighed means computed on the balanced and trimmed datasets
See box for the definitions

Sources: Banque de France, Bundesbank

Data: March 1998

Before using more sophisticated methods, the basic static model can help us to answer the following question: does the variation of the debt ratios over time differ by size category? This is done by estimating a model in first differences where time dummies are replaced by a time trend. One of the tests is to allow this time trend to vary across size classes.

In France, the time trend is significant. When the time trend is allowed to vary by size class, appropriate tests corroborate that differences across size class trends are not significant, i.e. that the reduction of debt over time is roughly similar across these size classes. Lastly, the different year dummies confirm that the reduction of leverage had already started at the beginning of the period under review.

In Germany, unsurprisingly, the results of such a model suggest that the time trend by size class is not significant and the year dummies confirm the fact that the debt ratio's decrease over time is rather slight and confined to the early nineties.

These results are corroborated by the use of more sophisticated techniques. Several models have been tested and three approaches are reported (see box and table). This first approach using the "exogenous" model gives three results.

- Firstly, the lagged coefficient cannot be neglected. This indicator suggests that adjustment costs play a major role in describing the borrowing behaviour of French and German enterprises. French firms seem to adjust more slowly than their German counterparts.
- Secondly, the specification based on the long-term growth rate of total assets provides more plausible results for both countries with respect to the theory than turnover growth. Here the positive signs of firm growth and the collateral proxy support the signalling approach.
- Finally, the expected negative impact of cost of finance emphasizes the sensitivity of the business credit demand to interest rates. The negative sign of the profit variable is in line with the pecking order theory.

The "endogenous" model gives estimated coefficients with much less precision. The negative coefficient of the profit variable remains the most robust result, corroborating the pecking order theory. The collateral and cost of finance variables are no longer significant. In this set-up, the risk variable coefficient becomes significantly positive.

The "mixed" model gives the most satisfactory results. All variables but one have significant coefficients with signs well explained by theory. Collateral seems to be unimportant for German firms, which contradicts the traditional argument concerning the role of collateral in both countries in the event of insolvency.

In conclusion, what are the main results with respect to borrowing behaviour? They are summarized in the following table for the dynamic model estimated on the basis of total samples. We focus on the results for the growth of the total assets variable, which gives the most reliable results.

Summary of the main econometric results concerning borrowing behaviour

		Exogenous model		Endogenous model		Mixed model	
		France	Germany	France	Germany	France	Germany
Adjustment coefficient		0.85	0.55	0.77	0.50	0.87	0.55
Growth rate of total assets	Short term	0.19	0.14	0.31	0.16	0.20	0.14
	Long term	1.29	0.30	1.37	0.32	1.50	0.30
Collateral	Short term	0.02	0.12	<i>-0.07</i>	<i>0.10</i>	0.10	<i>0.11</i>
	Long term	0.13	0.25	<i>-0.30</i>	<i>0.19</i>	0.80	<i>0.25</i>
Profit	Short term	-0.77	-0.68	-0.82	-0.47	-0.72	-0.63
	Long term	-5.27	-1.50	-3.61	-0.94	-5.50	-1.37
Cost of finance	Short term	-0.29	-0.72	<i>-0.02</i>	<i>-0.11</i>	-0.30	-0.69
	Long term	-2.00	-1.59	<i>-0.07</i>	<i>-0.23</i>	-2.28	-1.52
Measure of risk	Short term	<i>0.02</i>	<i>0.004</i>	0.25	0.69	0.16	0.63
	Long term	<i>0.14</i>	<i>0.010</i>	1.12	1.37	1.20	1.38

NB: The coefficients in italics are not significant at the 10% level. Long-term coefficients are calculated by dividing the short-term ones by $(1 - \text{the adjustment coefficient})$.

Sources: Banque de France, Bundesbank

Data: March 1998

First, French and German firms show surprisingly similar behaviour. Most of the variables are significant for both countries and mostly have the same signs, and the differences between the estimated models according to the hypotheses formulated are very similar. Our estimates are, on the one hand, in favour of the signalling approach (growth, collateral) and, on the other, in favour of the view of financial hierarchy or pecking order (profit). They also support the traditional textbook interpretation that an enterprise's credit demand is sensitive to its own price.

Second, size and time are the relevant variables where marked discrepancies in borrowing behaviour occur between both countries. Descriptive statistics and variance analysis show that time is an important determinant for France, but not for Germany. This suggests that macroeconomic factors (namely the impact of tax policy and the end of the so-called "debt economy" in France), which cannot be captured by microeconomic variables, are also responsible for firms' debt behaviour. This said, the size dimension seems to be a very important explanatory variable for Germany alone. Small German firms depend more on external funds than large enterprises, which supports the cost of access theory for Germany. Needless to say that the availability of these external funds is ensured by the Hausbank system.

Our study provides some additional insight into borrowing behaviour. By breaking down our samples into size classes, it would appear that the behaviour of the various size classes is not identical in both countries. The most interesting result may be the similar increase in the impact of the cost of finance (in both a short- and long-run perspective) when moving on from small firms to consider the larger ones: in France and in Germany, larger firms seem to be more sensitive to the cost of finance than small ones. This may reflect the fact that larger firms have other alternatives, namely access to capital markets.

To conclude, in spite of clear institutional differences between France and Germany, borrowing behaviour is less divergent than one might have thought at first sight. With respect to the explanatory variables of growth, collateral, profit, cost of finance and risk, the relationships with corporate debt are relatively similar.