Volume Title: Asymmetric Information, Corporate Finance, and Investment

Volume Author/Editor: R. Glenn Hubbard, editor

Volume Publisher: University of Chicago Press, 1990

Volume ISBN: 0-226-35585-3

Volume URL: http://www.nber.org/books/glen90-1

Conference Date: May 5, 1989

Publication Date: January 1990

Chapter Title: Financial Systems, Corporate Finance, and Economic Development

Chapter Author: Colin Mayer

Chapter URL: http://www.nber.org/chapters/c11477

Chapter pages in book: (p. 307 - 332)

12 Financial Systems, Corporate Finance, and Economic Development

Colin Mayer

12.1 Introduction

Over the past decade there has been increasing interest in the role of institutions in the financial and real activities of the corporate sector. That interest is most clearly reflected in the plethora of models on imperfect information that have recently appeared in the finance literature. Several attempts have been or are currently being made to establish the empirical significance of these models for the financial behavior of firms. This volume reports the results of a number of such studies. However, a majority of this work is confined to one country, namely the United States, and examines only a small segment of a country's total financial system at any one time. It is therefore difficult to judge the broader significance of these models for the overall functioning of a financial system and to determine the extent to which they are relevant to different countries.

It is well known that there are significant variations in the structure of different countries' financial systems. Since Marshall there has been much discussion about the role of banks in the German financial system. Schumpeter, Gerschenkron, and Cameron all pointed to banks as an engine of growth of the German economy. More recently, similar consideration has been given to the role of banks in the Japanese economy and contrasts have been drawn

Colin Mayer is professor of corporate finance at City University Business School in London and codirector of the Centre for Economic Policy Research's program in applied microeconomics.

This paper is part of the Centre for Economic Policy Research's "International Study of the Financing of Industry." The CEPR study is being financed by the Anglo-German Foundation, the Bank of England, the Commission of the European Communities, the Economic and Social Research Council, the Esmee-Fairbairn Charitable Trust, the Japan Foundation, and the Nuffield Foundation. This paper was presented at the NBER Conference, "Information, Capital Markets and Investment Conference," Boston, May 1989. The author is grateful to conference participants for their comments, and especially to Roger Farmer and Glenn Hubbard. Ian Alexander provided excellent research assistance.

between the importance of banks and securities markets in Japanese and Anglo-Saxon financial systems, respectively.[1]

Prima facie, banking systems would be expected to avoid some of the information deficiencies associated with securities markets. A primary rationale for the existence of banks is that they perform screening and monitoring functions that individual investors can only undertake at high cost. Resource allocation, credit availability, and terms of loans may all, therefore, be superior under a bank-based than a market financial system. On the other hand, transaction costs may be lower in the absence of intermediation, and taxation may militate in favor of market-based sources of capital.

There are then several factors that finance theory suggests should influence the financing patterns of different countries' corporate sectors. The purpose of this paper is to compare the industry financing of eight developed countries and to evaluate these patterns in the context of alternative theories of corporate finance. International comparison of the financing of industry is a familiar subject. However, it is probably fair to say that, to date, it has only shed limited light on the functioning of different financial systems. In large part this is due to the unreliability of the underlying data. There are, for example, well-known problems associated with international comparisons of corporate sector gearing: the valuation of assets, the treatment of reserves and goodwill, and the double counting of intrasector flows all present serious difficulties. The extent to which such inconsistencies can be overcome by ad hoc corrections is questionable.

One justification for a reexamination of this subject at this time is that more reliable methods of comparison have been developed that overcome many of the problems that have afflicted previous studies. Problems remain but the degree of comparability reported in this paper is almost certainly greater than that of previous studies and probably about as great as existing data allow the researcher to achieve at an aggregate level.

The results suggest 10 stylized facts about corporate finance. These concern forms of finance in different countries and the relation between different forms of finance over time. The stylized observations are reported in Section 12.2 of the paper. In Section 12.3, alternative theories of corporate finance are discussed, and their relevance to explaining the observed financing patterns is considered. This is not supposed to be a test of alternative theories, merely an examination of the extent to which they are consistent with aggregate financing patterns in different countries.

Theory and observation bear directly on many of the issues that have been central to policy debates about financial systems. In particular, there is currently much discussion about the relative merits of banks and markets for promoting economic growth. As noted above, banks have traditionally been regarded as central to the promotion of economic growth. More recently, disillusionment with the role of banks in developing countries has intensified in the face of widespread corruption and bank failures. The World Bank (1989)

has, as a consequence, advocated the use of both securities markets and banks in promoting economic growth.

Likewise, as the emergence of a unified market in 1992 promises to create a high degree of homogeneity across the financial systems of member states, the strengths and weaknesses of different financial systems have been brought to the fore of policy discussions. Section 12.4 considers the implications of both empirical observations and theoretical models for the relative merits of securities markets and banks in promoting economic growth.

12.2 The Financing of Industry in Eight Countries

There are two sources of information available for studies of aggregate corporate financing patterns in different countries. The first is national flow-of-funds statements. These are records of flows between different sectors of an economy and between domestic and overseas residents. The relevant statement for this exercise is flows to and from nonfinancial enterprises. The second source is company accounts. These are constructed on an individual firm basis but are often aggregated or extrapolated to industry or economy levels.

Both sources have their merits and deficiencies. In theory, flow-of-funds statistics provide a comprehensive coverage of transactions between sectors. Company accounts are only available for a sample, often quite small, of a country's total corporate sector. However, the data that are employed in company accounts are usually more reliable than flow-of-funds. As Appendix A describes, flow-of-funds are constructed from a variety of different sources that are rarely consistent. As a consequence, statistical adjustments are required to reconcile entries.

As described in Mayer (1987, 1988) and Appendix B to this paper, the methodology employed in the Centre for Economic Policy Research Study of the Financing of Industry differs in several respects from that used by previous researchers. Greater emphasis is placed on flows of finance instead of stocks. Figures are recorded on a net (of accumulation of equivalent financial assets) as well as a gross funding basis. Financing proportions are aggregated over different time periods using a weighted as well as a simple average of individual years' proportions. Appendix B argues that these procedures achieve a greater degree of international comparability than has been available hitherto.

Tables 12.1, 12.2, and 12.3 report weighted and unweighted average financing proportions for the five countries of the international study (France, Germany, Japan, the United Kingdom, and the United States) and for Canada, Finland, and Italy using flow-of-funds statistics. Table 12.1 reports unweighted averages of net financing as a proportion of capital expenditures and stock building. Table 12.2 shows weighted averages of net financing using straight line depreciation over 16 years from 1970 to 1985. Table 12.3 records unweighted averages of gross financing as a proportion of total sources of finance.[2] The weighted and unweighted averages are similar.

Table 12.1 **Unweighted Average Net Financing of Nonfinancial Enterprises, 1970–85[a]**

	Canada[b]	Finland[c]	France	Germany[d]	Italy[e]	Japan[f]	United Kingdom[g]	United States[h]
Retentions	76.4	64.4	61.4	70.9	51.9	57.9	102.4	85.9
Capital transfers	.0	.2	2.0	8.6	7.7	.0	4.1	.0
Short-term securities	−.8	3.7	−.1	−.1	−1.3	N.A.	1.7	.4
Loans	15.2	28.1	37.3	12.1	27.7	50.4	7.6	24.4
Trade credit	−4.4	−1.4	−.6	−2.1	.0	−11.2	−1.1	−1.4
Bonds	8.5	2.8	1.6	−1.0	1.6	2.1	−1.1	11.6
Shares	2.5	−.1	6.3	.6	8.2	4.6	−3.3	1.1
Other	1.3	7.4	−1.4	10.9	1.0	−3.8	3.2	−16.9
Statistical adjustment	1.2	−5.0	−6.4	.0	3.2	N.A.	−13.4	−5.1
Total	99.9	100.1	100.1	99.9	100.0	100.0	100.1	100.0

Source: OECD Financial Statistics.

Note: Numbers are percentages.

[a]Net financing is shown as a proportion of capital expenditures and stock building. Gross financing is a proportion of total sources.

[b]For Canada, mortgages are included in loans, foreign investments are included in other, and capital transfers are included in retentions.

[c]Data on Finland refer to the period 1969–84. Errors in the OECD statistics have required that the statistical adjustment be altered as follows: 1971, DM 2 billion and 1973, +DM 89 billion.

[d]There is no statistical adjustment in German accounts. Funds placed with insurance companies and building and loans associations are included in loans.

[e]The Italian statistical adjustment was reduced by Lit2,070 billion in 1974 to make accounts balance. Trade credit is not recorded as a separate item in Italian flow-of-funds.

[f]Japanese flow-of-funds do not report retentions. The ratio of external to internal financing of Japanese enterprises has been obtained by applying proportions recorded in aggregate company accounts for the period 1972–84, as shown in tables 12.4 and 12.5. The Japanese figures therefore have to be treated with particular caution. Short-term securities are included in bonds.

[g]United Kingdom statistics refer to private enterprises only; were public enterprise to be included then entries would read as follows: retentions, 91.9; capital transfers, 5.7; short-term securities, 1.3; loans, 11.7; trade credit, −.7; bonds, −.9, shares, −2.5; other, 2.1; statistical adjustment, −8.5.

[h]The following modifications were made to the U.S. statistical adjustment to make accounts balance (in millions of dollars): 1970, −1; 1971, −3; 1973, +3; 1975, +1; 1976, −2; 1979, +2; 1981, −1; 1982, +1; 1983, −2; 1984, −1. Capital transfers are included under retentions in U.S. accounts. Acquisitions of central government short-term securities are not shown separately from bonds and have been subtracted from issues of bonds in table 12.2 below.

Observation 1. Retentions are the dominant source of finance in all countries.

The United Kingdom has the highest proportion of retentions (107% excluding public enterprises, 97% including public enterprises on a weighted net financing basis). Italy has the lowest, but, even here, over half of investment in physical assets and stocks is funded from retentions. This is not just a consequence of the procedure of netting uses of finance from sources. Even on a gross basis U.K. corporations obtain just over 70% of their total sources from retentions and U.S. corporations just under 70%.

Table 12.2 **Weighted Average Net Financing of Nonfinancial Enterprises 1970–85**

	Canada	Finland	France	Germany	Italy	Japan	United Kingdom[a]	United States
Retentions	78.1	64.2	N.A.	72.6	N.A.	N.A.	107.2	89.2
Capital transfers	.0	.2	N.A.	9.4	N.A.	N.A.	2.7	.0
Short-term securities	−1.2	4.1	N.A.	−.1	N.A.	N.A.	2.8	1.0
Loans	15.9	27.8	N.A.	12.0	N.A.	N.A.	2.2	25.4
Trade credit	−3.7	−1.8	N.A.	−2.5	N.A.	N.A.	−1.7	−1.4
Bonds	7.2	3.2	N.A.	−1.9	N.A.	N.A.	−2.3	11.7
Shares	2.2	−1.4	N.A.	.6	N.A.	N.A.	−3.6	−2.8
Other	1.0	6.5	N.A.	9.9	N.A.	N.A.	3.5	−17.2
Statistical adjustment	.5	−3.0	N.A.	.0	N.A.	N.A.	−10.8	−5.9
Total	100.0	99.8		100.0			100.0	100.1

Weights Used Above (The Product of Revaluation and Depreciation Factors)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Canada	.20	.39	.55	.69	.74	.78	.84	.88	.91	.89	.89	.89	.89	.93	.97	1.00
Finland	.29	.52	.70	.85	.90	.86	.87	.91	.91	.98	1.01	.94	.97	.97	.99	1.00
Germany	.11	.22	.32	.40	.46	.53	.59	.76	.71	.75	.78	.81	.87	.92	.96	1.00
United Kingdom	.32	.58	.79	.89	.90	.91	.93	.95	.95	.90	.87	.89	.93	.97	.99	1.00
United States	.17	.33	.47	.59	.62	.67	.73	.77	.78	.80	.79	.78	.81	.89	.94	1.00

Source: OECD Financial Statistics.
Note: Numbers are percentages.
[a]United Kingdom statistics refer to private enterprise. If public enterprise were to be included, then Retentions, 97.5, capital transfers, 4.2; short-term securities, 2.1; loans, 5.9; trade credit, −1.1; bonds, −1.7; shares, −2.6; other, 2.4; statistical adjustment, −6.5.

Table 12.3 **Unweighted Average Gross Financing of Nonfinancial Enterprises, 1970–85**

	Canada	Finland	France	Germany	Italy	Japan	United Kingdom[a]	United States
Retentions	54.2	42.1	44.1	55.2	38.5	33.7	72.0	66.9
Capital transfers	.0	.1	1.4	6.7	5.7	.0	2.9	.0
Short-term securities	1.4	2.5	.0	.0	.1	N.A.	2.3	1.4
Loans	12.8	27.2	41.5	21.1	38.6	40.7	21.4	23.1
Trade credit	8.6	17.2	4.7	2.2	.0	18.3	2.8	8.4
Bonds	6.1	1.8	2.3	.7	2.4	3.1	.8	9.7
Shares	11.9	5.6	10.6	2.1	10.8	3.5	4.9	.8
Other	4.1	6.9	.0	11.9	1.6	.7	2.2	−6.1
Statistical adjustment	.8	−3.5	−4.7	.0	2.3	N.A.	−9.4	−4.1
Total	99.9	99.9	99.9	99.9	99.9	100.0	99.9	100.1

Source: OECD Financial Statistics.
Note: Numbers are percentages.
[a]With the inclusion of public enterprise, U.K. statistics would be: retentions, 67.9, capital transfers, 4.2; short-term securities, 1.9; loans, 22.4; trade credit, 3.6; bonds, .6; shares, 3.9; other, 1.9; statistical adjustment, −6.4.

Observation 2. There are some marked variations in self-financing ratios across countries. In the United Kingdom and the United States, more than three-quarters of investment is funded from retentions. In Finland, France, Japan, and Italy, appreciably more is raised externally. Canada and Germany lie somewhere between the two groups.

Observation 3. In no country do companies raise a substantial amount of finance from securities markets.

Summing together short-term securities, bonds, and shares reveals that the largest amount raised in securities markets is 19% in Canada on a gross basis (i.e., as a proportion of total sources) and 13% on a net basis in the United States. In Germany and the United Kingdom, net amounts raised from these three sources were negative and gross amounts were only 3% in Germany and 8% in the United Kingdom. Only in Canada and the United States do bond markets raise a significant proportion of external finance for industry.

Observation 4. Banks are the dominant source of external finance in all countries.

Observation 5. Bank finance is particularly pronounced in France, Italy, and Japan. It represents a surprisingly small proportion of German corporate financing.

Bank finance accounts for approximately 40% of gross sources in France, Italy, and Japan. In Germany, the United Kingdom, and the United States, it only contributes around 20% of total sources. Netting off deposits, this falls to 8% in the United Kingdom. Rather strikingly, then, there is no support from these figures for the commonly held view that German banks contribute a substantial amount to the financing of their industry (see Carrington and Edwards 1979).

Comparing the gross and net financing tables demonstrates some of the problems associated with interpreting gross funding figures. In some countries, trade credit appears to be an important source of finance, in particular in Finland (see table 12.3). But much of this is intracorporate sector and does not contribute to total net financing. Table 12.1 correctly records that, overall, nonfinancial enterprises are *suppliers* of credit to other sectors, in particular to consumers.

Comparing tables 12.1 and 12.3 reveals that U.K. enterprises have been particularly heavy purchasers of financial assets. This has been primarily in the form of deposits, but purchases of shares have also been large. Acquisitions of financial assets in the United States mainly take the form of intrasector flows of trade credit and purchases of domestic shares and overseas assets.

The quality of some flow-of-funds data is questionable. Statistical adjustments reveal inconsistencies between series, and the coverage of some items, in particular trade credit, is known to be inadequate. U.K. data are particularly deficient in this respect. Table 12.1 recorded the fact that the statistical adjustment averaged 13% of gross investment over the period 1970–85—approximately twice that of any other country.

Table 12.4 **Unweighted Average Net Financing of Non-financial Corporations**

	Finland	France	Japan	United States
Period	1975–84	1976–84	1972–84	1970–85
Retentions	66.4	66.9	57.9	87.9
Capital transfers	1.8	1.2	N.A.	.0
Short-term securities	3.1	} 36.1	N.A.	.0
Loans	34.7		46.2	10.8
Trade credit	−7.2	2.5	−8.6	−2.5
Bonds	1.1	} −6.7	} .2	15.8
Shares	−2.4			−1.3
Other	4.8	.0	2.4	−3.9
Statistical adjustment	−2.4	.0	1.9	−6.9
Total	99.9	100.0	100.0	100.0

Source: Company accounts as reported in OECD Financial Statistics.
Note: Numbers are percentages.

Table 12.5 **Unweighted Average Gross Financing of Nonfinancial Corporations**

	Finland	France	Japan	United States
Period	1975–84	1976–84	1972–84	1970–85
Retentions	41.3	36.1	33.7	64.6
Capital transfers	1.0	.6	N.A.	.0
Short-term securities	2.2	} 31.3	N.A.	1.5
Loans	34.5		36.4	12.5
Trade credit	13.0	25.4	15.0	10.4
Bonds	.6	} 6.6	2.1	12.5
Shares	4.3		4.9	4.0
Other	4.6	.0	7.8	−.2
Statistical adjustment	−1.6	.0	.0	−5.2
Total	99.1	100.1	99.9	99.8

Tables 12.4 and 12.5 repeat the financing proportion exercise using company accounting data where they are available. There is a strong similarity in the financing patterns that emerge from the two sources of data. However, there are a few differences. Bank loans are more significant in Finland but much less significant in the United States than suggested by the flow-of-funds data. Bonds are even more significant in the United States as a source of finance for industry than flow-of-funds data indicate.

Average financing ratios, therefore, look similar for the two sources of data. However, nothing has been said to date about the extent to which these proportions have changed over time or the correlation between different forms of finance. Flow-of-funds data are too short (16 observations per country for the series standardized by the OECD) to provide accurate guidance on either of these questions. In contrast, company accounting information has been collected for nearly 40 years in the United Kingdom.

The graphs in figure 12.1 and 12.2 are based on aggregate company accounting information. In interpreting the graphs it should be borne in mind that there was a significant change in sampling procedures in 1977.[3] The graphs suggest the following observations:

Observation 6. U.K. investment has been consistently financed from retentions (91% on average). Bank finance has contributed close to zero (3% on average) on a net basis.[4]

Observation 7. There is a strong inverse relation between the proportion of expenditure financed from retentions and bank credit.

Confirmation for observation 7 comes from an examination of correlations between different forms of finance. Table 12.6 records the correlation between retentions and other sources of finance. Retentions are strongly inversely correlated with trade credit and bank credit on both a gross and net basis. The fact that this is true of gross as well as net bank credit indicates that short-term financing requirements are satisfied by raising bank loans as well as reducing cash balances.

Despite only having a short time series available for other countries, table 12.7 reveals a remarkable consistency in this pattern of correlations. Loans and trade credit are inversely related to retentions in all countries. On a net

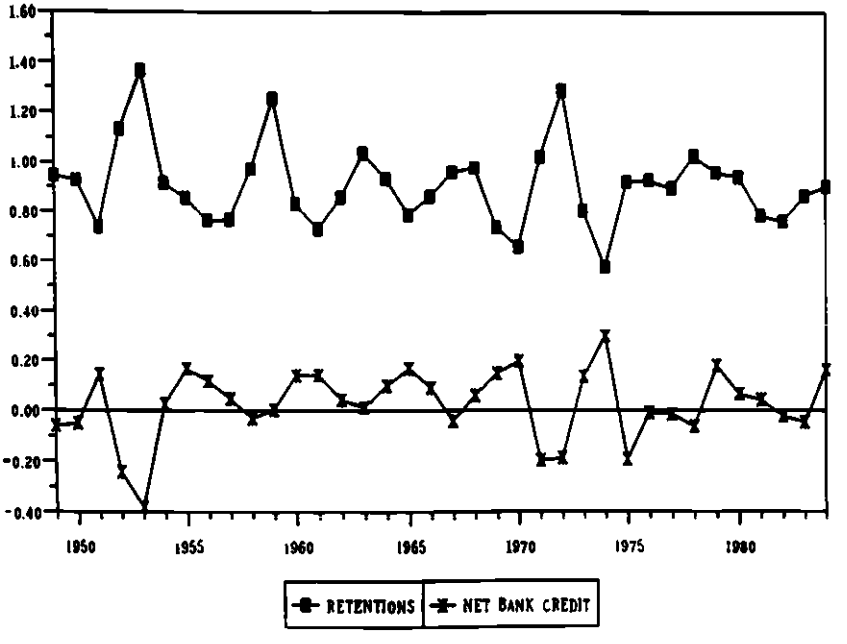

Fig. 12.1: Retentions and net bank credit in the United Kingdom (proportions of physical investment)
Source: Goudie and Meeks (1986).

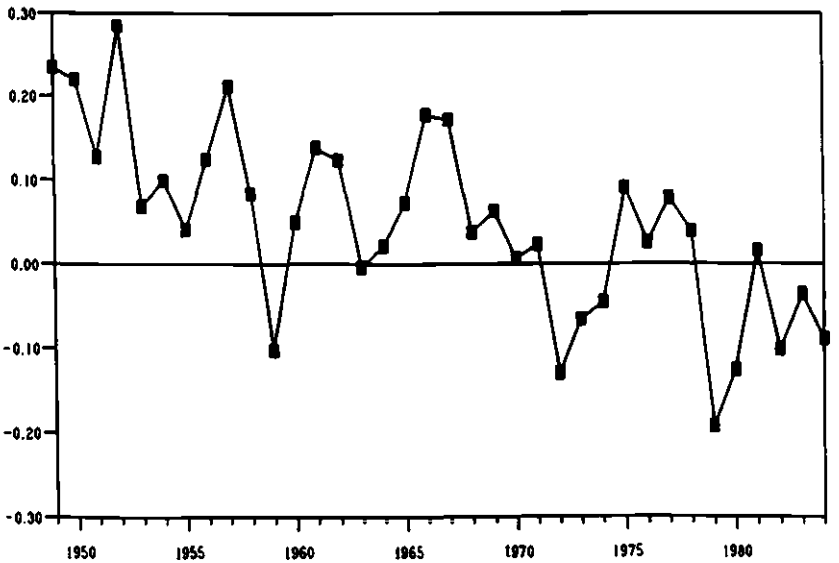

Fig. 12.2: Net issue of securities in the United Kingdom (proportion of physical investment)
Source: Goudie and Meeks (1986).

Table 12.6 Correlation Matrix for U.K. Quoted Companies, 1949–77

		Gross Source				Net Source		
	Retentions	Trade Credit	Bank Credit	Long-term Debt	New Equity Issues	Trade Credit	Bank Credit	Securities Issued
Investment	.23	−.17	.13	−.11	−.08	.66	.15	−.41
Retentions	1.00	−.73	−.73	−.07	.03	−.51	−.83	−.23

Note: (1) Gross and net sources are defined as a percentage of total gross and net sources, respectively. Investment and retentions are defined as a percentage of total gross sources for the first five columns and retentions is defined as a percentage of total net sources (i.e., physical investment) for the last three columns. The absolute value of investment is used in the last three columns.

basis (table 12.8), the strong inverse relation with loans remains. However, with trade credit the correlation is considerably weakened and in many cases eliminated. This may be just a reflection of the poor quality of trade credit data in flow-of-funds statistics or an indication of the intracorporate sector nature of the transaction, not fully revealed by the partial coverage of company accounts.

Observation 8. Securities markets have declined in significance as sources of finance for British industry. Trade credit increased in importance at the end of the 1960s and early 1970s.[5]

There is no evidence of financial innovation and deregulation being asso-

ciated with a growth in the contribution of market sources of finance.[6] Cross-sectional evidence suggests that high retention proportions in the United Kingdom are not merely a consequence of low industrial growth. Two relatively high growth industrial sectors (chemicals and allied firms, and electrical engineering) recorded financing proportions that were equal to or in excess of those in other industries (table 12.9).

However, there are marked differences in financing proportions of different size of firms within industries. Since 1977, the U.K. Department of Trade and Industry has categorized firms by two size groups: (1) large and (2) medium and small companies.[7] Table 12.10 below records the following:[8]

Observation 9. Small- and medium-sized firms are considerably more reliant on external finance than large firms. A smaller proportion of small- than large-company finance comes from securities markets.

Confirmation for the greater role of banks in small company financing comes from an examination of stock as well as flow proportions in table 12.11. However, it should be borne in mind that pre- and post-1977 data are not directly comparable.

Observation 10. Bank (and short-term) finance account for approximately two-thirds of U.K. companies' total debt but more than five-sixth of small companies' total debt.

These ten observations, or stylized facts, warrant explanation.

Table 12.7 **Correlations between Proportions of Retentions and Proportions of Other Forms of Gross Finance**

Proportion of	Canada	Finland	France	Germany	Italy	Japan	United Kingdom	United States
Short-term securities	.05	−.58	.00	.02	.34	N.A.	−.11	−.31
Loans	−.78	−.43	−.37	−.59	−.74	N.A.	−.73	−.45
Trade credit	−.40	−.33	−.37	−.36	N.A.	N.A.	−.69	−.84
Bonds	.16	−.14	.43	−.55	−.32	N.A.	−.34	.42
Shares	−.01	.26	−.25	.05	−.12	N.A.	.45	−.20

Table 12.8 **Correlations between Proportions of Retentions and Proportions of Other Forms of Finance**

Proportion of	Canada	Finland	France	Germany	Italy	Japan	United Kingdom	United States
Short-term securities	−.54	−.67	−.40	−.01	−.52	N.A.	−.25	−.40
Loans	−.78	−.47	−.45	−.57	−.88	N.A.	−.70	−.67
Trade credit	.03	−.40	−.41	−.07	N.A.	N.A.	.02	.01
Bonds	−.30	.12	.13	−.76	−.03	N.A.	−.36	.02
Shares	.72	−.17	−.47	.32	.05	N.A.	−.10	−.09

Table 12.9 **Financing Proportions in Two Industries in the United Kingdom**

	Gross Proportions			Net Proportions		
	Total Sample	Chemicals and Allied Industries	Electrical Engineering	Total Sample	Chemicals and Allied Industries	Electrical Engineering
Retentions	59.1	62.7	59.2	91.0	89.7	117.3
Trade credit	17.5	12.7	17.1	1.5	−2.2	−11.9
Bank credit	5.6	3.2	1.6	2.7	−2.2	−20.4
Long-term liabilities	6.8	13.3	6.7	4.8	14.7	15.0
Issues of Shares	10.9	8.0	15.4			
Total	99.9	99.9	100.0	100.0	100.0	100.0

Source: Goudie and Meeks (1986); Business Monitors (M3).
Note: All averages are unweighted. The total sample refers to the period 1949–84; chemicals and allied and electrical engineering industries relate to the period 1949–82.

Table 12.10 **Financing Proportions of Large, and Medium- and Small-Sized Companies in the United Kingdom: Average, 1977–1982**

	Retentions	Banks, Short-term Loans and Trade Creditors	Issues of Shares and Long-term Debt	Other Sources
All companies:				
Large	70.9	23.2	5.7	.2
Medium and small	52.6	45.7	1.3	.3
Chemical companies:				
Large	70.5	20.2	7.6	1.6
Medium and small	50.3	50.5	3.8	−4.7
Electrical companies:				
Large	79.4	19.4	3.1	−1.9
Medium and small	60.4	37.4	2.4	.1

Source: Business Monitors (M3).

12.3 Alternative Theories of Corporate Finance

There are five classes of theory to which one might turn for an explanation of the above financing patterns: an irrelevance proposition, transaction costs, taxation, information and control theories. These will be considered in turn.

12.3.1 Irrelevance

The most widely cited theory of corporate finance is the Modigliani and Miller proposition. This states that in the presence of perfect and complete capital markets and in the absence of taxation, corporate valuations, and costs of capital are independent of firms' capital structures.

At face value, this proposition suggests no underlying determinant of corporate capital structure: the financing of industry is a matter of indifference—

an accident of history and a product of random influences. However, the stability of financing patterns over time and countries that has been noted above argues strongly against the thesis of indifference. The 10 stylized observations warrant explanation. The indifference proposition does not provide it and cannot, on its own, be treated as a serious basis for explaining international patterns of corporate finance.

12.3.2 Transaction Costs

Combined with transaction costs or taxation, the theory is much more powerful. The most immediate implication of introducing transaction costs is to establish a preference for retention over external finance. This is quite consistent with observation 1.

However, the United Kingdom and the United States are generally regarded as possessing the most highly developed and efficient financial systems of any country in the world. This proposition rests uneasily alongside the observation that they have the lowest external financing proportions of any of the countries in the study (observation 2).

Of course, this may merely reflect a low demand for external finance. But even the composition of external finance does not correspond with the predictions of a transaction cost theory. The most striking case of international variations in transaction costs comes from observations on equity markets. In some countries, stock markets are very small. For example, in France and Germany, less than 500 companies are quoted. This compares with 1,700 in Japan and 2,000 in the United Kingdom. French and German market capitalizations were 20% of gross domestic product (GDP) at the end of 1986 as against nearly 90% in Japan and the United Kingdom and 50% in the United States. But, over the period of this study, the United Kingdom and the United States raised, at best, approximately the same amount of (and probably in practice rather less) new equity finance for their industries as France and Japan. It is not merely a matter of transaction costs being a few percentage

Table 12.11 **Ratio of Stock of Bank and Short-term Loans to Total Short- and Long-term Debt: Average 1977–82 (in percentages)**

All companies:	66
Large companies	63
Medium and small companies	87
Chemical companies:	47
Large chemical companies	46
Medium and small chemical companies	93
Electrical companies:	73
Large electrical companies	66
Medium and small electrical companies	94

Source: Business Monitors (M3).
Note: Bank loans relate to both short- and long-term loans. The table is not therefore informative about maturity of debts.

points higher in some countries than others but a difference between companies having very general access to securities markets in some countries and very limited access elsewhere.

Turning to bond finance, the surprising feature is how little is raised in a low-cost, unregulated Eurobond market by European corporations in relation to domestic issues by North American firms. Over the period of this study British firms were net purchasers (or repurchasers of bonds) and Canadian firms significant net issuers. In contrast, according to one report (OECD 1989), direct costs of issuing bonds were relatively high in Canada (1.7% for large issues) in 1982/83 and low in the United Kingdom (1.1% for large issues).

Finally the notion that ratios of external to internal finance merely reflect investment demands is undermined by comparisons of low- and high-growth sectors. Two of the highest-growth sectors (electronics and pharmaceuticals) had the highest retention proportions.[9] In any event, transaction costs are probably in general swamped by tax considerations.

12.3.3 Taxation

The first point to note about taxation is that in virtually every country of this study (with the possible exception of Finland) debt finance has been favored over equity. This stands in marked contrast to the universal preference for equity finance (including retentions) over debt finance (observation 1).

More generally, table 12.12 records a poor relation between tax incentives to employ different forms of finance in the eight countries of the study and actual financing proportions. On the left-hand side, table 12.12 ranks the tax incentive to use debt in preference to retentions, new equity issues in preference to retentions and new equity in preference to debt. Countries at the top have the highest incentive to use the first form of finance in each case. On the right-hand side, it reports actual financing proportions from table 12.1 of this paper.

The most striking country in the first part of table 12.12 is Germany, which has the highest incentive to use debt in relation to retentions and the second lowest use of debt relative to retentions. The United Kingdom has the lowest debt-to-retentions ratio and the third highest tax incentive. The picture is not very much better for the ratio of new equity to retentions where Germany now has the third lowest new equity proportion and the highest incentive and the United Kingdom still has the lowest proportion and the fourth highest incentive.

It might be objected that comparisons of internal and external financing proportions and incentives are distorted by transaction costs and investment requirements. The third part of the table may therefore be regarded as more instructive. There the most striking case is Finland, which has the highest incentive to use new equity in preference to debt and the second lowest proportion. The United Kingdom also has a remarkably low new equity propor-

Table 12.12 **Comparison of Ranking of Eight Countries' Tax Incentives to Employ Different Forms of Finance with Average Financing Ratios over the Period 1970–85**

Tax Incentive[a]	Financing Ratio[b]
Debt/retentions:	
Germany	Japan
Japan	France
United Kingdom	Italy
Canada	Finland
Italy	United States
France	Canada
United States	Germany
Finland	United Kingdom
New equity/retentions:	
Germany	Italy
Italy	France
Canada	Japan
United Kingdom	Canada
France	United States
Finland	Germany
Japan	Finland
United States	United Kingdom
New equity/debt:	
Finland	Italy
Italy	France
Canada	Canada
France	Japan
United Kingdom	Germany
Germany	United States
United States	Finland
Japan	United Kingdom

Source: OECD (1986) and table 12.1 of this paper.

[a]Tax incentives are based on the approach described in King and Fullerton (1984). The OECD calculations are based on the "fixed-p" case and the results reported above relate to "actual inflation." Tax incentives are computed as the ratio: $\frac{(1 - t_i)}{(1 - t_j)}$, where t_i is the effective tax rate on source of finance i. Tax incentives relate to tax exempt institutional investors and investment in equipment.

[b]Financing proportions are based on table 12.1 in this paper, that is, unweighted average net financing from flow-of-funds sources. Debt is defined as the sum of short-term securities, loans, trade credit, and bonds.

tion in the face of a high incentive resulting from its imputation system of taxation.

There are several objections that can be raised against this type of comparison. There are well-known problems in comparing tax incentives across countries. The figures on which table 12.12 are based come from an OECD extension of the King-Fullerton (1984) study. These derive tax incentives created by both corporate and personal taxation on the basis of a Modigliani and Miller (as against a Miller) equilibrium model of the economy. They do not

take account of cross-border tax incentives to locate, finance, and invest in different countries, and they have been found to be very sensitive to respecifications of the model. In addition, the tax incentives in the OECD study relate to investment in equipment, not structures, and tax-exempt institutions, not households. In fact, the ranking of incentives is virtually identical for structures and equipment but is sensitive to the assumed tax rate of investors.[10] Finally, the tax incentives refer to one year, 1983, while the financing proportions are averages over the period of the study, 1970–85. Averaging over the period 1982–84 revealed that the ranking of external to internal financing proportions is similar around the date of measurement of tax incentives. Despite all these possible sources of inaccuracy, there would have to be a remarkable level of mismeasurement for taxation to provide a credible explanation for observed financing proportions.

12.3.4 Information Theories

At first sight, information theories appear to be quite consistent with many of the results reported in this paper. For example, Myers's (1984) pecking-order hypothesis suggests that riskless securities (debt) are used in preference to risky (new equity) and retentions are used in preference to external sources of finance (observations 1 and 3).

However, the thesis on which the aversion to new equity finance is based (Myers and Majluf 1984) is an insider-outsider model in which owners are raising finance from outside investors. It says nothing about the preference of owners between subscribing themselves in the form of new equity issues and increasing retentions by cutting dividends. Since rights issues are frequently employed in Europe (almost all new equity issues are rights issues in France and the United Kingdom), the sale of equity to external investors does not arise in many of the countries of this study.

Furthermore there is little support for Myers's prediction that equity finance is employed at high levels of gearing when debt becomes risky. Even in Japan and Italy, where gearing levels have been high, there is little new equity finance (observation 5).

Some aspects of international patterns of corporate finance appear consistent with information models. Observation 3, that bond finance is significant in Canada and the United States, is consistent with the unusually large number of bond-rated companies in these countries. In contrast, there are just 30 bond-rated nonfinancial corporations in the United Kingdom, 14 in France, and 4 in Germany.

However, if anything, this relation between bond finance and ratings raises something of a puzzle. If it is possible to establish institutions that perform a pure information-gathering exercise, then what is the role of banks? Information theory cannot explain why there is a clear preference for bank finance in most countries (observation 4) and why bank finance remains important in the United States.

On a similar score, an analysis of credit evaluation procedures of banks in different countries reveals that the information content of banks is similar in different countries. There may be two exceptions to this: Germany and Japan. Both countries have close relations between banks and industry. In Germany, banks frequently have representatives on the boards of large firms (Edwards and Fischer 1990). In Japan there is regular interchange of personnel between banks and firms (see Corbett 1987). But in Germany an unusually small proportion of corporate sector finance comes from banks, while Japan has an unusually large proportion (observation 5).

Information deficiencies do not provide a convincing explanation for observed international patterns of corporate finance on their own. There is an aspect of the relation between institutions and firms that information theories fail to capture. The next subsection suggests that this has to do with control rather than monitoring of firms.

12.3.5 Control theories

The previous subsection has noted that agent-principal problems can arise where information asymmetries exist. Imperfect information is one but not the only explanation for why agent-principal problems may arise. Problems of verifiability and enforceability of contracts as well as observability may undermine the writing and implementation of complete contracts. Alternatively, writing complete contracts may simply be too expensive.

In the absence of complete contracts, the allocation of control over the deployment of assets matters. Those who control the employment of assets should be residual claimants. The amount of finance that those who are not in control are willing to provide will be dependent on the amount that they can realize if they do take control (see Mayer 1989a).

Control theory is most closely associated with Philippe Aghion and Patrick Bolton.[11] They argue that the amount of debt finance that a firm will choose is dependent on the point at which it is optimal for control to be transferred from entrepreneur to creditor. Thus extemal financing is dependent on the relative productivity of creditors and entrepreneurs in particular states of nature.

More generally, control theory suggests that extemal financing is dependent on (see Mayer 1989b): (i) the managerial ability of creditors; (ii) the nature of assets (the higher their realizable value, the higher is the creditor's reservation valuation and the greater is the amount of external finance that is available); (iii) the costs of coordinating creditors and the costs of bankruptcy and liquidation; and (iv) other nonfinancial controls that investors can exert on firms. More specifically, control theories lead to the following predictions.

PREDICTION 1. Gearing levels will be high where the value of assets under creditor management is high.

PREDICTION 2. Assets that are not specific to their current employment will attract more extemal finance.

PREDICTION 3. Where the costs of organizing external control are high, there will be little extemal finance.

PREDICTION 4. The relation between control and finance is weakened where interests of investor and manager do not diverge.

The observations of the previous section can be assessed in relation to these predictions. The first five observations on the dominant role of retentions, low contributions from securities markets, and the importance of banks in some countries are consistent with predictions 1 and 3. If extemal intervention is costly because creditors are either poor managers or difficult to organize, then own finance will dominate (observation 1) and be particularly large in countries in which management and finance are separated (observation 2). Creditors that are dispersed and difficult to organize will play an especially small role (observation 3). Instead, finance will come from intermediaries (observation 4) that are closely integrated into their corporate sectors (observation 5).

The relation between finance and control is particularly evident in the provision of working capital. The main providers of working capital (banks and trade creditors—observation 7) also have the most direct claim on assets in the event of default (fixed and floating charges). The ability to trigger these claims automatically with little direct managerial input means that institutions can smooth cash flows even where their longer term involvement is small (comparison of observations 2 and 7).

Predictions 2 and 3 help to account for observations 9 and 10. Small and newly formed companies have a low intangible (goodwill) to tangible valuation ratio. Therefore a smaller proportion of their assets are specific to their current employment, and investors can realize a larger proportion of their ongoing value in the event of default. As a consequence, the extemal financing ratio of small companies is higher than average (observation 9) and finance is provided by investors who can take control at low cost (observation 10). By way of a corollary, it is worth noting that capital market deficiencies will be particularly pronounced in firms with a high proportion of intangible assets (i.e. companies involved in substantial research and development (R&D) programs) and few own resources. This is consistent with the Schumpetarian hypothesis that product market dominance is required to provide finance for R&D.

As for the other two observations, the apparent constancy of financing pattems (observation 6) supports the emphasis that is placed on structural factors (quality of management, nature of assets, and costs of creditor coordination) by control models. The decline in the proportion of certain classes of extemal finance (observation 8) probably then reflects a shift in the balance of corporate and investor control as the complexity of corporate organizational arrangements increases in the United Kingdom.

Observations on intemational pattems of corporate finance are therefore suggestive of the relevance of control theories of finance. However, there is one observation that at least at first sight appears inconsistent with control theories. Despite having a banking system that is closely integrated with its

corporate sector, German industry raises a comparatively modest proportion of its finance in the form of loans (observation 5).[12] Prediction 4 was that the relation between finance and control would break down where investor and management interests do not diverge. This description, it is suggested, is applicable to German bank-investor relations.

Schonfield (1965), in his classic account of the German financial system, saw banks as the prefects of German industry. Their power derived from their equity investments, their proxy votes, and their representation on supervisory boards (the *Aufsichtsrat*). Knight (1988) views the relation as more advisory than dictatorial and echoes the sentiments of German bankers when he concludes, "The evidence then points to the banks as sometimes providing companies with independent, well-informed and well-connected nonexecutive chairmen able to make a powerful contribution to the board's performance" (15). Consensus or command, the need for financial control is lessened by the other instruments that German banks have at their disposal.

12.4 Conclusions and Policy Implications

A quite striking observation to emerge from the empirical analysis is that in no country do securities markets contribute a large proportion of corporate sector financing. In some countries, the average net contribution was close to or less than zero. Equity markets are particularly deficient in this respect. That is not to say that equity markets do not perform an important function. They may promote allocative efficiency by providing prices that guide the allocation of resources or productive efficiency through reallocating existing resources via, for example, the takeover process. But in terms of aggregate corporate sector funding, their function appears limited. Instead, a majority of external finance comes from banks. Why?

Neither transaction costs nor taxation were found to provide adequate descriptions of corporate financing patterns in different countries. One interpretation for the preponderance of bank finance is that financial intermediaries perform a central function in diminishing one of the most serious deficiencies of financial markets: asymmetries in information. According to this view, banks play an important role in collecting and processing information that markets are unable to do or can do only at high cost.

There is almost certainly a large element of truth in this story. But the analysis of the section 12.3 suggested that imperfect information is not an adequate description on its own. Information gathering can be quite effectively performed by institutions other than banks. Furthermore, the distinguishing feature of banks in different countries does not appear to be the nature of or the way in which they collect information.

Instead, it is the extent to which and the form in which institutions influence the activities of firms that appear to show marked variations across institutions and countries. Is control direct in the form of representation on the boards of

firms or indirect in the form of takeovers? Do financial institutions or individual shareholders initiate changes in control? How easy is it to form coalitions of shareholders or bond holders and how serious are free-rider problems of control?

The analysis in the previous section suggested that control theories provide a good basis for understanding the 10 stylized observations of this paper. They emphasize the managerial functions of financial institutions and suggest that the central role of banks comes from their ability to intervene and take control at comparatively low cost.

If this is right, then the implication of both the empirical observation of a preponderance of external finance coming from banks and control models of corporate finance is that banks may be superior to markets in promoting economic development and growth. This may be particularly true in the early stages of development of both economies and firms before reputations have been established and adequate incentives exist to bring borrowers' and lenders' interests into line. In the longer term intermediaries may be less central to the development of firms.[13] But in the early stages of the growth of firms and economies an efficient banking system may be an essential requirement for expansion. During these periods, securities markets are unlikely to be effective substitutes.

Appendix A
Alternative Sources of Data

There are two sources of information on corporate financing: flow-of-funds statistics and company accounts. Company accounts are available on an individual firm basis; flow-of-funds are aggregated across sectors. For this purpose, the relevant flow-of-funds sector is nonfinancial enterprises.

The primary advantage of flow-of-funds data is that their coverage is comprehensive. In contrast, company accounts are only available for a limited number of firms and samples are frequently a small proportion (by number) of all enterprises. On the other hand, definitions of enterprise sectors differ across countries. In theory, Standard National Accounting (SNA) conventions stipulate that private and public corporations should be included in the nonfinancial enterprise sector. Unincorporated businesses should be included in the household, not the nonfinancial enterprise sector. In practice, as table 12A.1 records, only Canada abides by the SNA definition.

The major problem with flow-of-funds data is that they are collected from a variety of different sources. For example, in the United Kingdom, profits are largely based on tax returns to the Inland Revenue and loans and securities

Table 12A.1 Definitions of Nonfinancial Enterprise Sectors

Country	Definition
Canada	As for SNA
Finland	Includes unincorporated enterprises
France	Excludes large public corporations
Germany	Includes unincorporated enterprises
Italy	Excludes some public corporations
Japan	Excludes large public corporations
United Kingdom	Excludes public corporations
United States	Includes unincorporated enterprises, excludes public corporations

issued on returns by financial institutions to the Bank of England. As a consequence, sources and uses do not, in general, balance and a statistical adjustment is required to reconcile entries.[14]

A fundamental distinction between flow-of-funds statistics and company accounts is that the former only relate to domestic activities while the latter are constructed on a worldwide basis including foreign subsidiaries. Thus issues of bond and equity securities are restricted to those made on domestic markets in flow-of-funds accounts but include issues on all markets in company accounts. Company accounts are therefore more suitable for analyzing how different countries' corporate sectors fund themselves, but flow-of-funds allow the contribution of a domestic sector's financial system to be identified.

Overall there is a presumption that company accounts are more accurate than flow-of-funds. However, company accounting analyses are lengthy exercises, frequently involving the manipulation of very large data banks. As yet comprehensive information is only available on the United Kingdom. Even here, there are serious discontinuities in aggregate series. For example, in 1977 the sample of U.K. company accounts was extended from firms quoted on the stock exchange to a representative sample of all companies.

For other countries, aggregate company accounts constructed by the OECD have had to be used. These suffer from similar discrepancies in the definitions of sectors to flow-of-funds. Eventually, comprehensive accounting information on the five countries of the study will be available which will provide a greater degree of comparability than has been available to date. In the meantime, more emphasis is placed in this article on flow-of-funds sources. The relative merits of company accounts and flow-of-funds are summarized in Table 12A.2.

Table 12A.2 **A Comparison of Flow-of-Funds and Company Accounts as Descriptions of the Funding of Industry**

	Flow-of-Funds	Company Accounts
Consistency in definitions of corporate sectors	Can be poor	Own aggregation is possible
Coverage of companies	Comprehensive	Limited, sometimes very limited
Coverage of items	Domestic	Global
Internal consistency	Poor	Good
Quality of data	Can be very poor	Good

Appendix B
Derivation of Financial Statistics

This study differs from previous international comparisons in both the data it uses and the way in which those data are presented.

The Data

Most existing international comparisons use stock data from company balance sheets to derive gearing levels. Two serious objections have been raised against this approach. First, in the absence of inflation corrections. capital stock and equity valuations can be substantially underrecorded. In Japan revaluations of company accounts are uncommon and in Germany they are forbidden by law. As Aoki (1984) has noted. the failure of Japanese accounts to revalue assets. in particular land. has resulted in Japanese gearing levels being considerably overstated. Second. book values of assets and reserves are sensitive to depreciation schedules.[15] Accounting conventions on depreciation vary appreciably across countries. partly in response to differences in corporate tax regimes.

Problems with accounting valuations have led several authors to advocate the use of market valuations. However. consideration of the use of market valuations suggests a more fundamental objection to stock measures. Market valuations respond not only to inflows and outflows of new financial resources but also to changes in valuations of existing resources. Valuations serve many useful purposes but do not assist in measuring financial flows.

To see this. consider a company that purchases land on the uncertain prospect of striking oil. Suppose that the land costs £1 million and the company funds this entirely from a bank loan. Assuming no other resources. its initial gearing is 100%. If the company subsequently strikes oil and the valuation of the land rises to £100 million. its gearing level will drop to 1%. If it does not.

then values of both land and debt fall to £100,000 and the company is insolvent. The outcome of explorations appropriately affects valuations of debt and equity but does not alter the way in which the original investment was financed.

For this reason flows are used in preference to stocks. One implication of using flows rather than stocks is that retentions are defined on a gross of depreciation rather than a net basis. The reason for this is that by subtracting depreciation, financing is being distorted by accountants' estimates of valuation changes. These should not be part of a sources of funds account and are in any event inconsistently measured across countries.

Data Presentation

All financing proportions are recorded on a net basis: acquisition of financial assets are subtracted from increases in corresponding liabilities. The rationale behind using net financing proportions is that aggregate corporate financing figures attempt to answer the question, in what form did the nonfinancial corporate sector as a whole fund its physical investment? Intracorporate sector flows should net out, and offsetting flows should be eliminated. Thus, for example, from the perspective of the company sector as a whole, new equity issues by one company are offset by repurchases of equity of equal magnitude by another company. Any other approach leads to nonsensical results.

Consider, for example, a company that is required to make a compensating deposit of £30 for £100 of finance raised. Compensating deposits are common in Japan and the United States. The company has raised £100 gross but only £70 net. But suppose the company voluntarily holds £40 in deposits; should it be treated as having raised £70 or £60? Clearly net financing raised from the bank in this period has been £60. It may choose at a later date to increase this to £70 but the additional £10 has to be attributed to that period in which financial assets are reduced.

Economic theory does not currently allow reductions in stocks of financial assets to be distinguished from increases in financial assets. When a robust theoretical distinction is available then separate classification will be appropriate. Control theory offers just such a distinction by distinguishing finance by degrees of intervention. Ironically then, the theory that this paper emphasizes will in time invalidate the netting approach that has been advocated here. However, at the current time the appropriate null hypotheses that should guide the construction of financing data are Modigliani and Miller irrelevance propositions and corporate taxation models.

In moving from single projects to company finance, flows in different time periods have to be aggregated. The most straightforward approach is simply to average financing proportions. However, that does not take account of amounts of finance raised and so puts undue emphasis on periods of low in-

vestment. Instead, averages could be created by revaluing flows of different classes of finance to constant prices and then aggregating them. If a capital goods price index is used for revaluations, this is equivalent to weighting financing proportions by gross levels of investment at constant prices. An appealing alternative is to weight by *depreciated* values of investment at constant prices. This answers the question, what would the capital structure of a company be if it replicated its existing capital stock using the same sources of finance as it employed in the past? The average is calculated as follows:

$$\frac{\sum_{t=1}^{T}(I_t^j \times a_{t,T}) \times (P_T^k/P_t^k)}{\sum_{t=1}^{T}\left(\sum_{J=1}^{j} I_t^j \times a_{t,T}\right) \times (P_T^k/P_t^k)},$$

where I_t^j = amount of type j finance raised in period t ($j = 1, \ldots J$, t = 1, . . . T); $a_{t,T}$ = depreciated value in period T of a unit investment in period t; P_t^k = capital goods price index in t.

Notes

1. See, e.g., Carrington and Edwards (1979) and Rybczynski (1988).
2. There is a strong similarity between the financing proportions recorded for the United States in table 12.3 and those reported in Goldsmith (1965) for earlier periods. Goldsmith reports the following for the period 1946 to 1958: retentions, 58.2; loans, 25.7; bonds, 9.6; equities, 6.4.
3. See App. A for details.
4. It is only slightly in excess of this on a gross basis—6% on average.
5. Comparisons of financing proportions in n. 2 above with table 12.3 suggests that a similar decline has occurred in the United States over the second World War period. Taggart (1985) demonstrates that the decline has been a long-run one. He reports the following financing proportions for the U.S. nonfinancial corporations since the turn of the century:

Period	Retentions (%)	Short-term Liabilities (%)	Bonds & Mortgages (%)	Equities (%)
1901–12	55	8	23	14
1923–29	55	4	22	19
1949–53	64	16	14	6
1979–83	64	26	9	2

6. That observation is not dependent on netting uses from sources. Issues of long-term liabilities and shares averaged as follows:

	1950–59	1960–69	1970–79	1980–84
Long-term liabilities	7.5	10.8	5.6	−.7
Shares	11.1	14.9	8.5	8.0

However, it should be bome in mind that pre- and post-1977 data are not directly comparable.

7. For the period shown in table 12.10 large firms are defined as those with capital employed of more than £4.16 million.

8. Goldsmith (1958) records a similar distinction between small and large firms in the United States in an earlier period. Gross financing proportions for the period 1946–52 were:

	Retentions (%)	Bank Loans & Trade Credit (%)	Bonds & Mortgages (%)	Equities (%)	Other (%)
300 large corporations	59.1	7.2	14.1	8.1	11.3
All other corporations	53.0	22.7	12.6	5.0	6.8

9. Research on individual company data in several countries, not reported here, confirms that electronic and pharmaceutical firms generally use little extemal finance.

10. The orderings of France and Italy in the debt: retentions comparison and of Japan and the United States in the new equity: debt comparison are reversed when investment in structures is considered instead of investment in equipment. Otherwise the orderings are unaffected.

11. See Aghion and Bolton (1988). See also Hart and Moore (1989) and Williamson (1988).

12. There are, of course, numerous other services that German universal banks provide for their customers, for example, bond and equity issuing facilities, and portfolio management services for investors. In addition, banks were probably a more important source of finance in earlier periods.

13. See Diamond (1989) for a theory of choice between bank and bond finance that is consistent with this.

14. There is no statistical adjustment in Germany. Instead, adjustments are made to recorded items to eliminate any discrepancy.

15. For a convincing demonstration of this point see Fisher and McGowan (1983). See also Harcourt (1965).

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