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CORPORATE FINANCE IN
THE EUROMARKETS AND THE
ECONOMICS OF INTERMEDIATION

Phil Davis and Colin P Mayer

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ABSTRACT

Corporate Finance in the Euromarkets and the Economics of Intermediation*

This paper examines bond and syndicated bank finance in the Euromarkets. It uses a comprehensive data bank on Euromarkets to evaluate alternative theories of financial intermediation. A model is estimated that provides a good description of firms' choice of finance. The paper concludes that Euromarkets are best described by control ('transactions banking') rather than commitment ('relationship banking'). Bank and bond markets are not perfect substitutes, however, even for large companies: the financing of high-risk projects requires the involvement of banks. Banks therefore retain a central function and the operation of bank syndicates is crucial to the financing of large corporations.

JEL classification: G32

Keywords: Eurobonds, syndicated bank credit, theories of financial intermediation

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Submitted 1 July 1991

NON-TECHNICAL SUMMARY

Between 1972 and 1990, the Euromarkets have grown rapidly with international bond issues increasing eight times in real terms. Despite this, little is known about the operation of Euromarkets and their contribution to corporate financing.

The Euromarkets are of particular interest to the study of financial intermediation. Through banks and markets respectively, syndicated bank credits and Eurobonds offer large companies similar forms of finance in a variety of currencies. They are therefore a valuable source of information on factors influencing firms' choice between intermediated and market sources of finance.

This paper reports the results of an analysis of all Eurobond issues and syndicated bank credits by UK and US firms since 1972. It draws on a unique data base on Euromarkets collected by the Bank of England. The paper discusses the size of the markets, the scale of issues, their frequency, maturity and patterns of issuance. It also describes an analysis of the determinants of maturity and choice of finance between bank and bond markets. The model of choice of finance that has been estimated provides a remarkably good description of the data.

Four theories of financial intermediation are evaluated: the traditional economies of scale theory, theories of monitoring, control models and commitment theories.

The paper finds little support for economies of scale theories, in which banks can provide small amounts of finance to firms more cheaply than markets. The paper finds, however, that the average size of syndicated credits is systematically larger than Eurobonds. Fees are similar in both markets and are proportionate to size of issue, not proportionately larger for small issues. This does not rule out the possible importance of economies of scale for the financing of small firms; they do not, however, provide a satisfactory explanation of choice of finance by large firms in the Euromarkets.

Monitoring theories emphasize one aspect of economies of scale – the function of banks in screening and monitoring firms. According to these theories, firms are restricted to banks as sources of finance until they establish sufficiently strong reputations to allow finance to be provided by markets with little monitoring. Monitoring theories therefore suggest that firms progress from bank to bond finance as they grow and mature.

Consistent with this thesis, only a few firms access the bond market in the UK and these tend to be higher rated firms. Switching between bank and bond markets, however, is not unidirectional: firms frequently obtain bank finance after they have issued bonds. The evidence on monitoring is therefore inconclusive.

There is one particular aspect of Euromarket financing that monitoring theories are unable to explain and that is the non-price characteristics of loans. Syndicated bank loans frequently have intricate covenant provisions that restrict the amount of debt that firms can issue, the dividends payments that they can make and several other features of corporate activities. Such covenants are not usually present in bond finance. Furthermore, bank finance tends to be of significantly shorter maturity than bond finance. Maturities of Eurobonds in general vary between 5 and 30 years; syndicated bank credits typically have maturities of between 3 and 15 years.

To explain these differences between Eurobonds and syndicated bank credits, it is necessary to turn to control theories of corporate finance. These emphasize the incomplete nature of contracts that are signed between creditor and borrower. To avoid risks of exploitation, lenders seek provisions in debt contracts that allow them to restrain the activities of borrowers that are contrary to their interests. Covenants and short maturities on loans can be interpreted in this way. Furthermore, since a small number of banks will in general be better placed to exercise control than a large dispersed group of bondholders, it would be expected that control will be particularly closely associated with bank finance, as reported above.

The value of control will be greatest where creditors are exposed to the largest risks. Thus bank finance should be associated with the highest-risk loans. That is precisely what is observed in our sample: smaller firms tend to borrow from banks and larger loans tend to be syndicated credits. Bank finance is particularly prevalent during periods of heightened credit risk. In addition, control theories predict that maturities of loans will decrease as risks increase. Again this is confirmed by the empirical analysis: maturities of loans decrease with the size of loans and increase with the size and credit quality of firms. Control theories therefore provide a good explanation of observed financing patterns in Euromarkets.

A related but distinct theory associated with commitment between borrowers and lenders receives less support. Commitment theories emphasize repeated interaction between borrowers and lenders as a way of discouraging exploitation of lenders by borrowers and vice versa.

Long-term relations, however, are not a feature of international credit markets. Firms frequently change the lead banks that arrange syndicated credits and bond issues. As a consequence, many of the aspects of finance that would be expected to be associated with long-term relations are not observed. Banks do not assist firms during periods of financial shortage; on the contrary, syndicated bank finance is strongly procyclical. In addition, commitment theories are unable to explain the relations between either choice or maturity of finance and quality of firms that were noted above.

To summarize, observed patterns of financing in the Euromarkets are most consistent with control theories of corporate finance, while theories of commitment and economies of scale appear less relevant. The absence of countercyclical forms of finance in Euromarkets, however, suggests that commitment may be a particularly important aspect of domestic bank lending.

In addition, the paper points to a role for bank finance that has been absent from much discussion about international capital markets. Bond markets are often regarded as playing an increasingly important role in relation to bank finance. This paper reveals that bond and bank finance are not perfect substitutes, even for the largest companies. High-risk projects and large-scale investments (for example acquisitions) require the involvement of banks in controlling risks to which lenders are exposed, even for the largest firms.

The operation of bank syndicates is crucial in this regard. Coordination of members of syndicates is required to ensure that control of borrowers can be exerted. This may necessitate the involvement of central banks to avoid the free rider problems to which syndicates are otherwise exposed.

1 Introduction

Over the past two decades, the euromarkets have grown rapidly. For example, between 1972 and 1990 international bond issues increased 24 times in nominal terms and 8 times in real terms. Despite this, little is known about the operation of the euromarkets and their contribution to corporate financing.

There is one aspect of euromarket activity that is of particular interest. Companies raise long term⁽²⁾ debt finance either through bond issuance or syndicated bank lending. There are a number of theories of firms' choice between intermediated and market finance: economies of scale, monitoring, control and commitment. Distinguishing between these is in general complicated by the wide variety of factors that influence corporate capital structure, including financial regulation. This paper is able to provide a greater degree of control by focusing directly on choice between bonds and bank finance for a particular class of large corporations in an unregulated financial market.

Eurobonds⁽³⁾ are bearer bonds issued in markets other than those of the currency of issue. A syndicated credit is a credit facility offered simultaneously by a number of banks from more than one country that sign the same loan agreement and stand equally in right of repayment. The common feature of syndicated credits and eurobonds is that nationality of investors and currency of issue diverge. For example, a majority of both eurobonds and syndicated credits are dollar denominated. In both cases, at least some investors, be they banks or other investors, are not US residents.

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- (2) Euronote facilities offer short term debt in the euromarkets; but these are generally a complement rather than a substitute for bonds and credits.
 - (3) Technically the database also includes a number of issues of foreign bonds, ie bonds issued in domestic markets by foreign borrowers. In the text we retain the term 'eurobond' for the sake of simplicity.

This paper utilises a unique database maintained by the Bank of England that provides details of all eurobond issues and announcements of syndicated credits⁽⁴⁾ since the early days of the euromarkets in 1972.

The paper is structured as follows. Section 2 describes theories of intermediation and influences on choice between bank and bond finance, derives predictions from contending theories of debt finance and presents a set of testable propositions which are evaluated in Section 7. Section 3 describes the process by which finance is raised on the eurobond and syndicated bank credit markets and the terms on which finance is available. Section 4 examines time series data on issues in the two markets. Section 5 examines cross-section patterns of issue by different classes of firms. Section 6 performs econometric analyses of determinants of maturity and choice between bank and bond finance for individual firms as well as aggregate time series tests on the determinants of relative issuance in bank and bond markets. Section 7 evaluates contending theories in the light of the empirical results of Sections 3 to 6. Section 8 draws conclusions.

(4) For recent surveys of the syndicated credit and eurobond markets drawing on the database, see Allen (1990) and Chester (1991).

2 Theories of financial intermediation

There are four theories of financial intermediation: economies of scale, information, control and commitment. In this section we outline each theory and derive predictions regarding patterns of financing.

2.1 Economies of scale

The traditional theory of intermediation relies on the presence of economies of scale (Gurley and Shaw (1960)). Economies of scale arise from indivisibilities and nonconvexities in transaction technologies which restrict diversification and risk sharing under direct financing. On the liabilities side, banks can pool risk and diversify portfolios more cheaply than individual investors. There also economies of scale in the provision of payments services. On the asset side, banks can lend more easily than individuals owing to their ability to manage investments at lower cost. However, this theory does not distinguish banks from other financial intermediaries such as mutual funds which may also benefit from economies of scale (Goodhart (1989)).

The theory predicts that there are economies of scale in banking that mean that smaller loans are made by banks and smaller firms tend to borrow from banks. But for large borrowers costs are similar for bond and bank finance. Therefore economies of scale are not a major consideration for large borrowers and choice between banks and bond markets is largely a matter of indifference.

2.2 Monitoring

A second set of theories is concerned with information asymmetries between borrowers and lenders. These arise from the inability of investors to screen the quality of entrepreneurs and firms (Leland and Pyle(1977)) and to monitor their performance (Diamond(1984)). There may be economies of scale in monitoring making delegation of monitoring to banks desirable. Banks may have informational advantages arising from ongoing credit relationships; from access to the borrower's deposit history (Fama(1985)); and from use of transaction services (Lewis(1989)).

In Diamond's model, banks offer standard debt contracts to borrowers which pay a fixed return in non-default states and impose penalties in the event of default. Costs of monitoring banks by depositors are avoided by portfolio diversification by banks which also allows standard debt contracts to be offered to depositors.

Reputations are important in a multiperiod context (Diamond(1989)). Reputations may be adequate to avoid excessively high risk investments and other moral hazard problems associated with imperfect information. In the absence of reputations, firms may be dependent on bank finance for the reasons discussed above. Only when a reputation has been established and has itself become a capital asset, by facilitating access to cheaper sources of funds, are agency problems reduced. At that stage firms are able to access the bond market and avoid costs of bank finance.

As regards predictions, according to monitoring theories, smaller and less well established firms borrow from banks and larger and well-known firms borrow from bond markets. Assuming firms establish reputations over time then they should borrow from banks initially and then bond markets later in the life-cycle. Highly rated firms borrow from bond markets and less well rated firms from banks.

2.3 Control

In the absence of complete contracts, lenders are vulnerable to exploitation by borrowers. This may, for example, take the form of forced refinancing to avoid threats of repudiation (Hellwig(1977)). Where possible, creditors will seek protection from such threats by retaining rights to control assets in the event of default. These rights may, for example, allow creditors to engage in liquidations that are costly to debtors (Hart and Moore(1988)).

Conversely, borrowers are vulnerable to exploitation by lenders during the period of gestation of the investment project when costs have already been sunk. These offsetting factors suggest that funding of long-term investment needs a balance of control between borrowers and lenders. A debt contract may provide such a balance by allowing entrepreneurs to remain in control as long as they are not in default (Aghion

and Bolton (1991)). If there is a default, control transfers to lenders. Banks may be better suited to exercise control than bondholders if there are free rider problems to the involvement of the latter in corporate restructurings (Bolton (1990)).

It is predicted that bank contracts will be more complex than bond contracts. For relatively high-risk firms, those who are better able to control the firm in default will be the providers of debt finance. Thus if there is a small number of bank lenders and a large number of bond investors then it would be expected that bank finance would be provided to more risky firms. The form of control will include collateral (or security) and covenants. Short maturities of lending are another form of control. Within a given risk class the greater degree of control that banks can exert may lead them to supply more unsecured loans and more lending in general; they may thus, for example, provide large one-off deals for capital expenditure projects and mergers.

2.4 Commitment

Mayer (1988) and Hellwig (1991) suggest that an alternative to control is commitment. For example, banks may only rescue firms if they anticipate being able to participate in the returns from such rescues. Superior information on the part of banks may tie borrowers to their original lenders and thereby allow creditors to capture the required benefits. Conversely, firms will only be willing to commit themselves to particular creditors if they believe that their creditors will not exploit their dominant position. Reputations of financial institutions may be adequate to ensure that this condition holds. Participants in bond markets may be unable to commit themselves in such a way.

It has been suggested that the bank oriented systems of Germany and Japan may be better suited to commitment than the market oriented Anglo-Saxon systems. Competition between financial institutions in the latter may make commitment on the part of borrowers difficult.

The theory predicts that banks and companies maintain relations in the bank loan market. These relationships are less important in the bond market. Bank lending will

3 Features of issuance and the characteristics of bank and bond markets

3.1 Eurobonds

Prior to the early 1980s the issuance procedure was as follows. A prospective borrower would approach an investment bank which would be invited to act as the lead manager of an issue. The lead manager would in turn invite a small additional group of banks to aid it in organising the issue (the managing group). Two other categories, the underwriters and the selling group, would be invited to participate in later stages of the issuance. Once the syndicate was formed and terms agreed the borrower would sell the bonds to the managing group which in turn would sell them direct to the underwriters or the selling group who in turn would distribute the bonds to the public. The function of underwriters was to commit themselves before the issue to buy the bonds at a set minimum price if they could not be sold by the managing group at a price above this minimum. The roles are not necessarily distinct; the lead manager may also be an underwriter and a seller.

Since the early 1980s, the principal issuance method has been the bought deal, wherein the lead manager buys the entire issue from the borrower prior to announcement. The issue is bought at set terms. Syndication of the deal is arranged after purchase. The role of underwriters and selling groups in this process is considerably reduced.

3.2 Syndicated credits

After initial contact between the borrower and the lead manager, the lead bank organises a managing group which supplies most of the loan. The lead bank also typically carries out the credit assessment for the other banks. After this it arranges an amount, interest rate spreads, the fixed maturity of the loan and other terms. At this stage a placement memorandum is prepared, on the basis of which other banks are invited to participate in the syndicate.

Amongst the most important features of syndicated lending is the distinction between a fully underwritten and best efforts loan. For a fully underwritten loan the managing banks are obliged to provide the loans whether or not there is sufficient demand from

be less pro-cyclical than bond issuance given the insurance that relationships provide. Third, bank loans will be rather frequent in the context of a continuing relation with the firm. Also bank lending will be of longer term maturity than bond finance (because the firm is committed to the relationship with the bank), and there will be little difference in terms of covenants and security between bank and bond finance.

These four theories need not be exclusive. For example, monitoring theories of intermediation rely on economies of scale in monitoring. Control and commitment models require incomplete contracts which might result from imperfect observability or verifiability of outcomes. But control models suggest actions on the part of lenders that do not feature in monitoring models and commitment models involve intertemporal relations that are not present elsewhere.

other banks. On a best efforts basis, if there is insufficient demand the size of the loan may be scaled down or the terms changed.

3.3 Security and covenants

Eurobonds are usually unsecured. There are few covenants associated with eurobonds other than a negative pledge that prevents future borrowing without giving existing borrowers equivalent security. Eurobonds are often issued with call provisions.

Syndicated bank credits are again unsecured and include similar negative pledges but in addition have numerous financial covenants relating to conditions such as minimum tangible net worth, total liabilities as a ratio of total tangible net worth, current assets to liabilities ratios, minimum working capital, restrictions on dividend pay-outs and net asset position. In addition to negative pledges, there are pari passu clauses that prevent the subordination of lending banks to unsecured creditors. There are cross- default clauses which give lending banks the right to accelerate repayments of loans in the event of borrowers defaulting on other indebtedness.

3.4 Fees and other terms

For Eurobonds published upfront fees are typically $1\frac{3}{4}\%$ to $2\frac{1}{2}\%$ depending on maturity. However, competition between banks in offering discounts and reallowances has reduced actual fees well below this, to levels of $\frac{3}{4}\%$ to $1\frac{3}{8}\%$ which are typical of domestic markets. The division of fees in a traditional syndicate is as follows: 60% for the selling group, 20% for the underwriters and 20% for the lead managers. In a bought deal the lead manager's share is considerably greater.

For syndicated credits, fees vary between $1\frac{1}{2}\%$ and $2\frac{1}{2}\%$. The lead manager gains 25% of the fees as do the managing banks, while the participating banks share the remaining 50%. In addition to these upfront fees there is a commitment fee of $\frac{1}{4}$ to $\frac{3}{4}\%$ on the unused portion of the credit.

- Maturities of eurobonds in general vary between 5 and 30 years while credits typically have terms of 3 to 15 years. Most eurobonds are fixed rate (though the data includes some floating rates) while syndicated credits are always variable rate (defined in terms of a markup over interbank rates). Partial drawdown of loans is possible but not for bonds.

any one year never exceeds 100, and the total number of firms issuing over 1972-89 is only 300, compared with over 500,000 extant UK firms. But the firms that do enter the euromarkets are evidently large; funds raised as bonds and syndicated credits are large both in an absolute sense and also (in some years) relative to total corporate borrowing.⁽⁵⁾

Table 1 also records that the number of financings in both bank and bond markets by UK firms was subdued till the mid-1980s, with a notable peak in credits in 1987-9. The US corporate sector appears to have turned to the international capital markets much earlier. The value data follow similar patterns. There is no obvious cyclical pattern to financing, and little evidence that bank loans rise relative to bonds in a recession.

Table 2: Average size of eurobond issues and syndicated loans (\$mn)

Year	US Companies			UK Companies			Eurobonds			UK Companies			Eurobonds		
	No.	\$mn	(1970 prices)	Syndicated Credits	\$mn	(1970 prices)	Syndicated credits	\$mn	(1970 prices)	Syndicated credits	\$mn	(1970 prices)	Syndicated credits	\$mn	(1970 prices)
1972	13	685	637	77	1989	1649	18	1230	1143	29	672	625	1972	53	49
1973	12	735	643	32	848	741	16	1018	890	11	323	282	1973	61	53
1974	27	1735	1366	7	142	112	17	2014	1586	4	82	65	1974	64	51
1975	6	255	184	10	305	220	7	147	106	8	431	311	1975	43	31
1976	10	451	308	13	593	405	9	384	262	18	957	653	1976	45	31
1977	5	678	434	21	1000	641	4	113	72	25	1158	742	1977	136	87
1978	17	2484	1479	16	993	591	10	2056	1224	16	554	330	1978	146	87
1979	22	1808	967	31	1923	1029	13	441	236	7	351	188	1979	82	44
1980	28	3159	1489	50	2691	1269	5	622	293	12	495	233	1980	113	53
1981	44	12035	5141	78	5320	2273	5	882	377	3	82	35	1981	274	117
1982	50	5650	2274	149	1079	4342	5	1048	422	9	489	197	1982	113	46
1983	31	3048	1189	67	4256	1660	2	78	30	15	763	298	1983	98	38
1984	16	2560	957	118	12349	4615	7	1628	608	20	1101	411	1984	160	60
1985	4	1275	460	251	22872	8254	4	259	93	32	2339	844	1985	319	115
1986	15	2236	792	229	24246	8587	8	779	276	56	5039	1784	1986	149	53
1987	50	11349	3877	157	15114	5164	53	29532	10090	57	5505	1881	1987	227	78
1988	40	12042	3952	112	12977	4259	84	33752	11077	57	8769	2878	1988	301	99
1989	60	35871	11234	81	9982	3126	66	20436	6400	52	7280	2280	1989	598	187

Table 1 shows the total number and value of issues of eurobonds and syndicated credits by UK and US firms over the period 1972 to 1989. It records that there are a relatively small number of firms operating in either market; the total number of firms issuing in

(5) For example, in 1989 UK firms' euromarket (gross) borrowing was \$28 bn of a total (net) borrowing requirement of \$100bn.

4 Aggregate patterns of issuance

Sections 4 and 5 discuss patterns of corporate finance in the eurobond and syndicated credits markets observed over the period 1972-89. Data used in this paper come from the Bank of England "International Capital Markets" (ICMS) euromarkets database. The database comprises details of all known euromarket financings since 1972. It covers eurobonds, syndicated credits and euronotes. The data used here from this source are the borrower, date of issue, amount raised (in local currency and dollars), maturity and lead managers. To this has been added data on credit ratings (from Dale and Thomas (1990)), three indicators of firm size (market capitalisation, sales and the book value of capital employed, all from Datastream) and the US 3-month Treasury bill rate.

Table 1: Total number and value of euro-bond issues and syndicated loans by non-financial private corporations 1972-89

Year	US Companies			UK Companies			Eurobonds			UK Companies			Eurobonds		
	No.	\$mn	(1970 prices)	Syndicated Credits	\$mn	(1970 prices)	Syndicated Credits	\$mn	(1970 prices)	Syndicated Credits	\$mn	(1970 prices)	Syndicated Credits	\$mn	(1970 prices)
1972	13	685	637	77	1989	1649	18	1230	1143	29	672	625	1972	53	49
1973	12	735	643	32	848	741	16	1018	890	11	323	282	1973	61	53
1974	27	1735	1366	7	142	112	17	2014	1586	4	82	65	1974	64	51
1975	6	255	184	10	305	220	7	147	106	8	431	311	1975	43	31
1976	10	451	308	13	593	405	9	384	262	18	957	653	1976	45	31
1977	5	678	434	21	1000	641	4	113	72	25	1158	742	1977	136	87
1978	17	2484	1479	16	993	591	10	2056	1224	16	554	330	1978	146	87
1979	22	1808	967	31	1923	1029	13	441	236	7	351	188	1979	82	44
1980	28	3159	1489	50	2691	1269	5	622	293	12	495	233	1980	113	53
1981	44	12035	5141	78	5320	2273	5	882	377	3	82	35	1981	274	117
1982	50	5650	2274	149	1079	4342	5	1048	422	9	489	197	1982	113	46
1983	31	3048	1189	67	4256	1660	2	78	30	15	763	298	1983	98	38
1984	16	2560	957	118	12349	4615	7	1628	608	20	1101	411	1984	160	60
1985	4	1275	460	251	22872	8254	4	259	93	32	2339	844	1985	319	115
1986	15	2236	792	229	24246	8587	8	779	276	56	5039	1784	1986	149	53
1987	50	11349	3877	157	15114	5164	53	29532	10090	57	5505	1881	1987	227	78
1988	40	12042	3952	112	12977	4259	84	33752	11077	57	8769	2878	1988	301	99
1989	60	35871	11234	81	9982	3126	66	20436	6400	52	7280	2280	1989	598	187

Syndicated credits are on average larger than eurobonds (Table 2) and have a more skewed size distribution: the largest issues account for a higher proportion of syndicated credits than of eurobonds both on average and for individual years. This is very similar in the UK and US. (Table 3). There is no obvious cyclical pattern though the proportion accounted for by the largest 10% of issues is more variable for credits than for eurobonds. This illustrates the fact that there are occasionally very large credits.

Table 3: Size distribution of borrowing
(% volume accounted for by largest 10% of issues)

Years	US Companies		UK Companies	
	Syndicated credits	Eurobonds	Syndicated credits	Eurobonds
1972	44	20	76	23
1973	27	20	39	18
1974	24	35	50	-
1975	39	33	27	23
1976	39	20	26	26
1977	37	36	-	33
1978	39	30	39	34
1979	37	31	23	29
1980	51	30	56	25
1981	59	31	74	-
1982	53	26	38	20
1983	25	26	-	29
1984	78	33	37	20
1985	-	26	-	19
1986	47	26	32	24
1987	32	26	56	20
1988	36	27	49	20
1989	88	24	50	20
average	44	28	45	24

Table 4: Largest issues (\$mn)

Years	US Companies		UK Companies	
	Syndicated credits	Eurobonds	Syndicated credits	Eurobonds
	\$mn	\$mn (1970 prices)	\$mn	\$mn (1970 prices)
1972	300	279	468	75
1973	200	175	200	59
1974	160	127	600	40
1975	100	72	40	29
1976	175	119	100	68
1977	250	160	220	141
1978	500	298	800	480
1979	500	268	100	54
1980	1100	518	350	165
1981	2100	896	650	277
1982	800	322	400	161
1983	275	107	55	21
1984	1500	561	607	227
1985	1000	361	100	36
1986	550	195	246	87
1987	1000	342	6436	2199
1988	1475	484	6000	1969
1989	13600	4289	2400	750

The largest syndicated credit is invariably larger than the largest eurobond (Table 4). Eurobonds have rarely exceeded \$500 million dollars, while the largest credit is \$13.6 bn. (6) Moreover, while the size of the largest eurobond issue is relatively constant in real terms, it has risen for credits. The largest US eurobond is generally larger than the corresponding UK issue; this is not the case for credits.

Table 5: Average maturities

Years	Eurobonds		Syndicated Credits	
	UK	USA	UK	USA
1972	16.13	14.36	2.08	3.85
1973	13.89	14.14	0.77	2.67
1974	16.45	8.72	6.95	3.21
1975	14.88	6.69	0.33	2.18
1976	11.24	7.18	5.11	4.79
1977	13.28	7.28	6.62	4.91
1978	11.38	5.55	9.88	4.64
1979	11.67	8.87	2.79	6.68
1980	11.32	8.42	6.9	7.06
1981	11.53	6.81	1.85	6.24
1982	9.01	8.25	3.98	5.57
1983	8.34	8.8	6.7	5.07
1984	8.63	7.69	5.38	5.45
1985	8.96	8.42	6.93	3.5
1986	12.73	8.55	5.	4.75
1987	12.38	8.13	8.39	3.63
1988	11.73	5.05	4.42	5.35
1989	12.72	4.79	4.53	4.38

The average maturity of eurobonds exceeds that of syndicated credits (Table 5). However, the average maturity of loans is longer than that in domestic markets. Maturities of bonds are longer in the UK than the US. This appears to be associated with higher credit quality in the UK (see Table 13). There appear to be cycles in eurobond maturity but not in syndicated credits.

(6) This was for the takeover of Nabisco by Kohlberg, Kravis and Roberts. Large UK credits have included the financing of Eurotunnel and the takeover of Pillsbury by Grand Metropolitan.

5 Patterns of issuance by individual firms

Most firms only participate in one market; issuance in both markets is restricted to less than 20% of firms in each case (Table 6).

Table 6: Firms' participation in markets

	United States	United Kingdom
Bonds only	383 (57%)	81 (27%)
Bonds and credits	78 (12%)	56 (19%)
Credits only	216 (32%)	163 (55%)
Total	677	300

Table 7: Corporate borrowing in the international capital markets

Number of Issues	Number of companies			
	United States		United Kingdom	
	International bonds	Syndicated Credits	International bonds	Syndicated Credits
1	257	221	69	84
2	80	52	32	32
3	44	14	12	5
4	18	7	13	7
5	18	3	6	1
6	9	1	4	0
7	3	0	1	0
8	6	1	3	0
9	5	0	1	0
10	1	0	0	0
11-15	9	0	0	0
16-20	6	0	1	0
21-25	0	0	1	0
26-30	1	0	0	0
31-35	1	0	0	0
36-40	1	0	0	0
41-45	2	0	0	0
46-50	0	0	0	0
51+	2	0	1	0
Total no. of companies active	463	299	145	230
	100%	100%	100%	100%

As shown in table 7, the mode of both distributions of issues per firm in the markets is one issue. The distribution is particularly concentrated in the credits market, but for firms that do make more than one issue the average number is much larger in the bond market; there are a small number of firms that issue bonds regularly. This pattern may imply that firms use credits for exceptional funding requirements, such as mergers or

project financings, while eurobonds are tapped on a regular basis to cater for firms' continuing financing needs. (7)

Table 8: Number of bond issues by each firm less number of syndicated credits

	United States	United Kingdom
-10+	0	0
-9	0	0
-8	0	0
-7	0	1
-6	1	0
-5	1	1
-4	1	2
-3	9	1
-2	37	18
-1	183	148
0	17	18
1	246	60
2	75	21
3	33	13
4	18	12
5	14	2
6	8	3
7	5	1
8	7	0
9	5	1
10+	19	4

Table 9: Ratio of bond issues to syndicated credits

	United States	United Kingdom
Bonds only	383	81
>10	7	2
8.1-10	2	0
6.1-8	2	1
4.1-6	7	1
2.1-4	11	13
1.1-2	18	14
1	16	18
0.8-0.99	0	0
0.6-0.79	3	2
0.4-0.59	7	3
0.01-0.39	5	2
Credits only	216	163

(7) This is not true of multiple option facilities, an arrangement which offers borrowers credit facilities for working capital purposes both via a committed revolving credit and by other uncommitted facilities in money markets (for a discussion see Allen (1990)).

There is a greater propensity for US firms to issue eurobonds than credits, while the converse is true of UK firms. US firms also tend to issue bonds more regularly than their UK counterparts. Tables 8 and 9 provide further information on patterns of issuance; table 8 subtracts the number of credits from the number of bond issues, while table 9 divides bonds by credits. Hence table 9 focusses on firms active in both markets. Table 8 suggests that where firms issue more than once in either market they tend to issue more bonds, but where they issue only once, national differences as outlined above are apparent. Table 9 shows unambiguously that firms active in both markets tend to issue more bonds than credits.

Table 10: Sequence of corporate borrowing

	United States	United Kingdom
Bond issue only	383	81
Credit issue only	216	163
Bond first	19	17
later credit only		
Credit first	24	14
later bond only		
Bond-credit-	21	16
-bond		
Credit-bond	15	6
-credit		
(Bond and later	40	33
credit)		
(Credit and later	39	20
bond)		

Where more than one type of finance is used there is a slightly higher proportion of bonds preceding credits than credits preceding bonds (Table 10). But data are also consistent with a random sequencing.

Table 11: Indicators of relationships with intermediaries I: (whole sample with more than one issue)*

% (number) Companies having:	US Companies		UK Companies	
	Syndicated credits	Eurobonds	Syndicated credits	Eurobonds
Less lead banks than currencies of issue	0%(0)	6%(10)	19%(4)	11%(6)
Same number of lead banks as currencies	72% (26)	44%(79)	48%(10)	45%(26)
More lead banks than currencies of issue	28%(10)	50%(90)	33%(7)	45%(26)

Table 12: Indicators of relationships with intermediaries II: (restricted to firms issuing more than once in one currency [and having made 3 or more issues])

% (number) Companies having:	US Companies		UK Companies	
	Syndicated credits	Eurobonds	Syndicated credits	Eurobonds
Less lead banks than currencies of issue	0%(0) [0%(0)]	3%(4) 4%(4)	0%(0) 0%(0)	5%(2) [7%(2)]
Same number of lead banks as currencies	72% (26) [71% (5)]	32%(42) [27%(26)]	50%(7) [40%(2)]	33%(14) [26%(7)]
More lead banks than currencies of issue	28%(10) [29%(2)]	65%(84) [69%(65)]	50%(7) [60%(3)]	62%(26) [66%(18)]

Tables 11 and 12 assess patterns of lead management for firms active in the euromarkets. On the assumption that firms may have a different lead manager for each currency, they examine the number of managers relative to the number of currencies in which the firm issues. Switching between lead managers in the same currency appears to be more common in the eurobond market than the credits markets, while very few firms use less lead banks than number of currencies. These points are particularly marked for the most active firms (Table 12). But note there is a significant degree of switching even in the credit markets.

Table 13 overleaf relates issuance to credit rating of firms. Due to lack of more comprehensive information, the ratings are only taken at one point in time (1990) and hence may differ from the rating at the time of issue. The data suggest that firms in bond markets tend to be rated more frequently than firms in the credit market. This is much more pronounced in the UK than the US. A large number of unrated firms in the UK and US access the bond market.⁽⁸⁾ Highly rated firms are more active in the bond market than lowly rated firms, but there is not much of a relation in the credit markets where issuance is more evenly spread across credit quality, with a high proportion of single issues. This is consistent with a greater sensitivity of bond markets to credit quality than banks, although it should be noted that there are also a large number of "speculative" US issuers active in the eurobond market.

(8) Some very large UK firms such as Grand Metropolitan and RTZ are not rated.

6 Determinants of maturity and choice of finance

Table 13: Credit ratings and issues

Rating range	No. of firms	No. of issues	Average issues	% Borrowers with only one issue
<u>UK Credits</u>				
1-5	23 (10%)	48	2.1	52%
6-10	18 (8%)	26	1.4	42%
Speculative	(-)	-	-	-
Not rated	188 (82%)	227	1.2	85%
<u>UK Bonds</u>				
1-5	31 (23%)	181	5.8	19%
6-10	18 (13%)	45	2.5	33%
Speculative	-	-	-	-
Not rated	86 (64%)	183	2.1	59%
<u>US Credits</u>				
1-5	34 (11%)	57	1.7	65%
6-10	75 (25%)	134	1.8	55%
Speculative	51 (17%)	70	1.4	78%
Not rated	141 (47%)	167	1.2	63%
<u>US Bonds</u>				
1-5	77 (17%)	537	7.0	36%
6-10	135 (30%)	542	4.0	38%
Speculative	81 (18%)	154	1.9	64%
Not rated	154 (34%)	223	1.4	77%

Source: Dale and Thomas (1990)

This section investigates the determinants of maturity and type of issue for UK firms. Firstly, pooled cross-section regressions of maturity were estimated for bond issues and credits. Secondly, choice of finance was estimated as a logit regression. Thirdly, an aggregate time series equation of relative issuance in the two markets was estimated.

There were 581 issues of eurobonds or credits in our pooled sample. 63.5% of which were eurobonds. The average size of issue was \$197 million with a range of \$2.8 million to \$6 billion. The average maturity of bonds was 10.9 years with a range of 1 to 30; the average maturity of loans was 5.6 years with a range of 1 to 18. The number of lead banks in both markets ranged from 1 to 17 with an average number of 4.8.

(i) Pooled cross section and time series data.

Table 14 reports regressions of bank credit and bond maturity on amounts of finance raised (at 1970 prices), firm size (total capital at 1970 prices) and average maturity of the relevant class of finance in the year of issue. The first two variables are indicators of risk to the lenders, while the last controls for aggregate market conditions.

Table 14: Determinants of maturity of bonds and credits for individual firms

OLS estimation			
<u>Bank loan maturity</u>			
Maturity in years =	3.95 (7.7)	- 0.00096 (3.0)	Amount raised (1970 prices)
		+ 0.00197 (5.1)	Total capital (1970 prices)
		+ 0.291 (3.2)	Average maturity in relevant year
R ² = 0.2 Se = 2.14 DW = 1.96			
<u>Bond maturity</u>			
Maturity in years =	-1.67 (1.0)	+ 0.035 (6.6)	Amount raised (1970 prices)
		- 0.0012 (5.1)	Total capital (1970 prices)
		+ 0.92 (7.0)	Average maturity in relevant year
R ² = 0.23 Se = 5.5 DW = 1.93			

There were marked contrasts between results for bank and bond finance. In banking, maturity depends positively on the size of the firm and negatively on the size of issue. In bond markets, maturity depends negatively on firm size and positively on issue size. In both markets average maturity of all financings in the relevant year was also significant.

The estimated coefficients imply that in the banking market, a £100 million increase in firm size raises maturity by 0.2 years. A £100 million increase in size of loan reduces maturity by 0.1 years. In the bond market, a £100 million increase in firm size reduces maturity by 0.1 years, while a £100 million increase in amounts raised increases maturity by 3.5 years. In interpreting these figures it should be noted that these amounts refer to 1970 prices⁽⁹⁾ and the size dispersion of bond issues is comparatively small.

The second set of tests relates to choice of finance. This was estimated by logit, with bond finance being given value 1, bank 0; independent variables were firm size (in 1970 prices) issue size (in 1970 prices), lead managers as a proportion of total issues for that firm, the dollar Treasury Bill rate and yield gap (10 year Treasuries less Treasury Bills), relative issuance in that year and relative maturity in that year. The equation can be seen as indicating the price to the firm of the two modes of finance, with the determinants of the cost of funds being the independent variables. Of these, the firm size and issue size can be interpreted as indicators of risk for the lenders; the number of lead managers tests for an effect of lack of relationships on issuance; the others proxy prevailing market conditions. Since maturities may be endogenous, estimated maturities from the regression reported in table 14 were used. The tests were performed with and without a lagged dependent variable. (10) Three types of firm size variable were used: market valuation, sales and capital employed, all in real terms. Results were similar - here we present those for market valuation. Time effects were

(9) The relevant deflator for 1980 is 3.5 and 1989, 6.0.

(10) The ldv was set at 0.5 where there was no previous issue, with a separate dummy set at 0 for no previous issue and 1 for a previous issue in either market.

examined by including time dummies in some of the regressions.

Table 15 reports that between 80 and 90% of choice of finance was correctly classified by the equations. Furthermore a large proportion of this is attributable to two variables: size of firm and size of issue. Larger firms access the bond market, whatever measure of firm size is chosen, while banks are used for larger funding requirements.

Table 15: Determinants of Market Choice for Individual UK Firms: Market Valuation

Logit estimation (Bank=0 Bond=1)				
Equation:	(1)	(2)	(3)	(4)
Amount raised (at 1970 prices)	-0.105 (6.9)	-0.105 (6.9)	-0.103 (6.8)	-0.102 (6.6)
Market valuation (at 1970 prices)	0.008 (6.4)	0.006 (5.4)	0.007 (6.3)	0.006 (5.2)
Total lead managers in both markets/Total issues in both markets	0.14 (0.3)	0.9 (1.5)	0.15 (0.3)	0.92 (1.5)
Average maturity of bonds/loans that year	-	-	0.29 (1.8)	0.37 (2.1)
Dollar T-bill rate	-0.066 (0.7)	-0.16 (1.5)	-0.007 (0.1)	-0.08 (0.7)
Dollar yield gap	-0.05 (0.3)	-0.14 (0.8)	0.007 (0.4)	0.003 (0.1)
Cycle (bond issue/bank loans that year)	0.33 (3.3)	0.35 (3.4)	0.35 (3.5)	0.37 (3.6)
Constant	1.1 (1.1)	0.35 (0.3)	-0.24 (0.2)	-1.46 (1.1)
Lagged dependent (last issue by this firm)	-	0.7 (1.8)	-	0.75 (1.9)
Ldv dummy	-	1.3 (4.1)	-	1.36 (4.2)
Log likelihood	-165	-155	-162	-150
Average likelihood	0.72	0.74	0.72	0.74
Cases correct	436/505	442/505	442/505	441/505
% correct	86%	88%	88%	87%

There is no consistent relation between number of lead managers and choice of finance. An increase in average maturity of bond issuance relative to banks in the relevant year leads to a greater tendency to bond issuance. The yield gap and short rate are insignificant. The lagged dependent variable was always significant and near to one, suggesting firms rarely switch modes of finance. Results were not affected by inclusion of time dummies (not reported).

Combining the results of the estimation of maturity and choice of finance suggests two offsetting effects of company and issue size on choice of finance. Firstly, larger firms issue bonds of shorter maturity; but, secondly they access bond markets which have longer average maturities more frequently. Graph 1 records the net effect of firm size on maturity. It has been computed by, firstly, estimating the relation between issue size and firm size, and then computing the following equation:

$$\begin{aligned} \text{Maturity} = & \text{Probability of bonds} \times \text{Maturity on bonds} \\ & + \text{Probability of credits} \times \text{Maturity on credits.} \end{aligned}$$

The graph shows that maturity on average increases with firm size but at a diminishing rate well below the average size of company.

(ii) Time series data.

As a further empirical test of the theories, an annual time series equation was estimated for the UK sample, to assess determinants of issuance in credit and bond markets. The dependent variable was defined as the log of the number of bond financings divided by the number of bank financings. The independent variables were short interest rates (US Treasury bills), cyclical indicators (total number of issues and growth rate of UK real GDP), a dummy for the 1970s to test for structural change, the secondary market yield differential between UK corporate and government bond rates and the average maturity ratio. The last variable was instrumented by lagged values of the independent variables in the financing equation. The following variables were also assessed but proved insignificant; a dummy for the debt crisis (equal to one between 1982 and 1985), the yield gap (US yield on government bonds less yield on US Treasury bills), value of takeovers in the UK as a proportion of GDP.

MATURITY AGAINST SIZE OF COMPANY

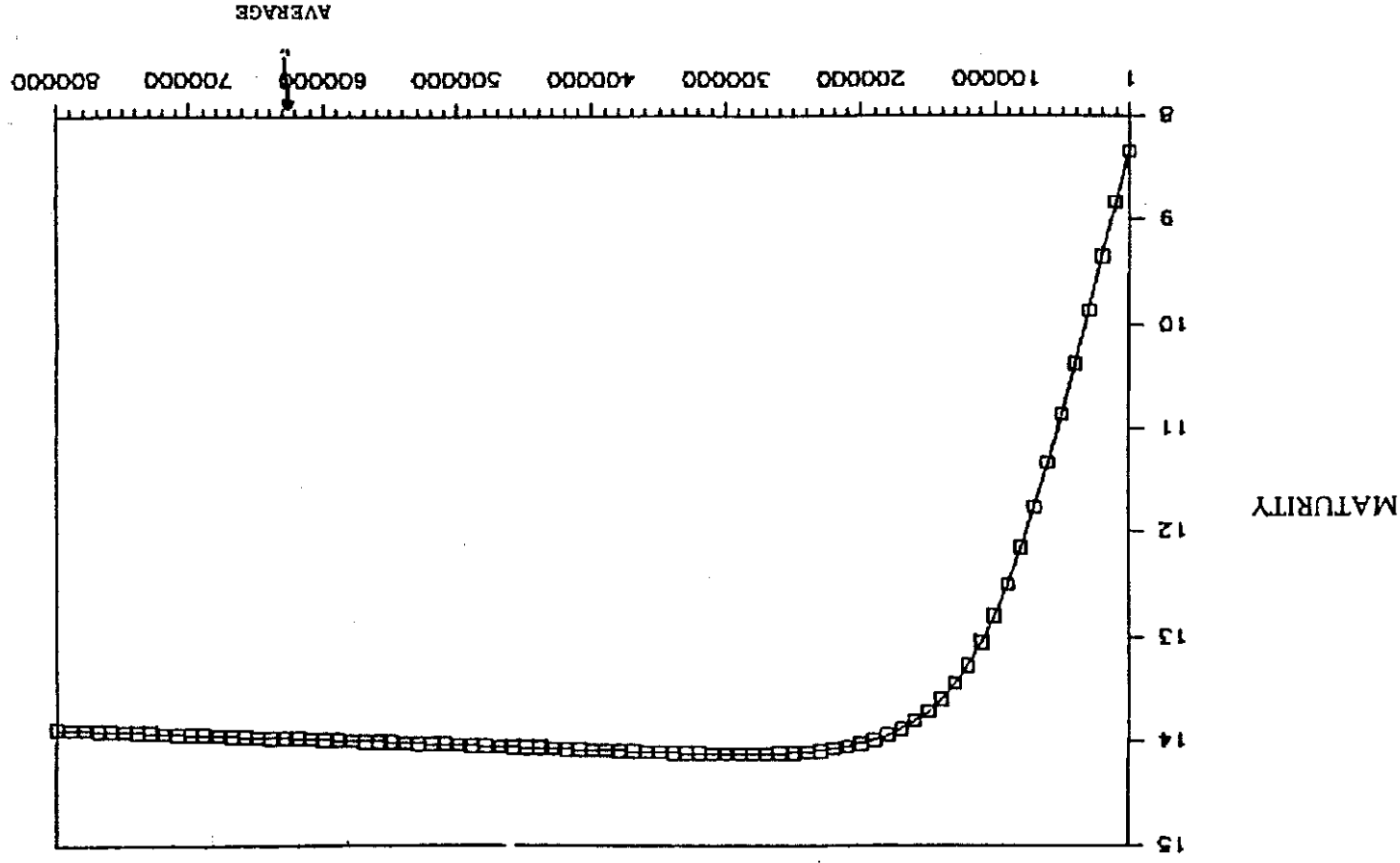


Table 18: Macroeconomic determinants of relative issuance in bond and banking markets

OLS estimation; dependent variable is log (number of bonds/number of credits)

	(1)	(2)	(3)	(4)
Constant	2.8 (4.8)	2.9 (4.3)	2.6 (4.8)	5.3 (3.9)
Dollar short rate	-0.35 (8.3)	-0.35 (7.7)	-0.34 (8.6)	-0.3 (3.3)
Total number of issues	-0.7 (6.2)	-0.68 (5.3)	-0.72 (6.9)	-
GDP growth	-	-	-	-10.7 (2.6)
Credit spread of UK corporate bonds	-0.55 (2.2)	-0.56 (2.2)	-0.4 (1.7)	-1.2 (2.6)
1970s dummy	-1.5 (6.8)	-1.9 (6.5)	-1.3 (5.3)	-1.5 (3.4)
Relative maturity instrumented ¹	-	-0.06 (0.3)	-0.2 (1.8)	-
R ²	0.84	0.83	0.87	0.44
Se	0.4	0.4	0.37	0.8
DW	2.3	2.3	2.2	1.1

¹ Instruments were lags of the other independent variables
² Not instrumented

Results were as shown in Table 18. The independent variables successfully capture a high proportion of the variance of aggregate relative issuance. Short rates, credit spreads and economic growth/total issuance were also positively related to bank

finance. Relative maturity had a negative sign, but was not significant. The significance of a dummy for the 1970s suggests a change in the pattern of issuance in the 1980s away from banks. This can be justified in terms of the structural deterioration in banks' credit standing relative to companies after the debt crisis (often referred to as "securitisation" (11)

The results are consistent with the cross sectional results. Higher risk (maturities, higher short rates, credit spreads) stimulate bank finance (although short rates can also be interpreted as a relative cost of funds variable). There is evidence of a structural break between the 70s and the 80s (given the same underlying conditions, companies were more likely to choose bank finance in the earlier period). Finally, bank lending appears more pro-cyclical than bonds.

(11) This has also entailed both a relative expansion of bond markets and a degree of blurring of boundaries between bank and bond finance (although as suggested by our results, there remain clear distinctions).

7 Evaluation of Theories

7.1 Economies of Scale

The results offer little evidence to favour the economies of scale theory in the euromarkets;⁽¹²⁾ for example the statistical tables show that the average size of syndicated credits is systematically larger than eurobonds. Again, the regressions are not consistent with economies of scale because we would expect to observe that choice of bond finance is positively related both to size of the firm and size of the transaction. In fact it is inversely related to issue size. Finally, fees are similar in both markets, and are proportionate to issue size rather than being proportionately larger for small issues.

7.2 Monitoring

Evidence for the monitoring hypothesis is inconclusive. For example, the tables show that, consistent with monitoring, there are only a few firms that access the bond market in the UK. In addition, in both countries higher rated firms access the bond market and are more active therein. Furthermore, firms tend to be active in only one market, thereby suggesting that reputations are required to enter bond markets. This result is confirmed by the significant and sizeable lagged dependent variable in the choice of finance regressions, which suggests that firms rarely switch modes of finance.

Evidence contrary to monitoring in the euromarkets includes the fact that only a few firms access syndicated credits.⁽¹³⁾ Highly rated firms are active in banking although they tend to make few issues. Of those that do, there is no clear sequence in which they

(12) Since only large firms access the euromarkets, the analysis does not exclude economies of scale in finance more generally (eg for small firms in domestic markets).

(13) Of course, monitoring may be relevant to the extent that only firms of high repute are able to access international markets at all.

issue. If anything bonds tend to precede credits. Also unrated firms issue bonds.

It is important to note that monitoring offers no explanation for patterns of maturity and covenants. The fact that there is a significant influence of firm quality on maturity thus suggests that monitoring is an incomplete explanation of patterns of corporate finance in the euromarkets.

7.3 Control

All three sets of econometric results offer evidence that favours the control hypothesis, and this is supported by the statistical tables and features of the markets.

As regards maturity, the control hypothesis suggests that maturity of bank loans should decrease as risk increases, ie when issue size increases and firm size decreases. The results are precisely consistent with these predictions. Second, control suggests that riskier financings should be made in the banking market, as banks are better able to control the associated risks. In other words, the price of riskier financings should be lower in the banking market. The choice of financing regressions suggest that this is indeed the case; smaller firms tend to borrow from banks, while large financings again tend to be syndicated credits. Third, in the time series regressions, indicators of heightened risk to companies such as credit quality spreads lead to a higher proportion of bank financings.

The statistical tables show that, consistent with control, highly-rated firms raise a higher proportion of bond to bank finance than low rated firms. The maturity of loans is shorter than that of bonds. The longer maturities of bonds in the UK are associated with higher quality firms on average. Loans are large supporting the notion that bank finance is associated with high risk to lenders; bonds are associated with comparatively modest amounts of finance. Finally, bank loan covenants are more detailed than those for bonds.

7.4 Commitment

On balance, the evidence tends to deny the relevance of the commitment hypothesis to corporate finance in the euromarkets. For example, in the maturity regressions

commitment suggests there should be no strong relationship of maturity to size of firm or size of issue; if there is strong commitment these factors should not impinge. In fact there is a marked relation of maturity to risk. Similarly, in the regressions for choice of finance, choice of bank finance should be unrelated to quality of firms, whereas again indicators of risk of the financing enter strongly. The results for choice of finance and the aggregate time series regressions show that bank financing is strongly pro cyclical; this is contrary to commitment, which suggests banks are more willing to lend in recessions than bond markets, so long as they are confident that relationships will be maintained.

The tables show that there are a significant number of changes in lead banks in syndicated bank credit markets, and hence relationships are not always maintained; however, relations appear to be even weaker in the bond market. Bond finance is of longer maturity than bank finance. Variable rate bank debt can be seen as indicating an inability of banks to commit themselves (at fixed rate) to the firm. Firms tap the bond market more regularly than they tap the credits market.

Some of the evidence is more consistent with commitment. There is a greater degree of flexibility in bank than bond finance, eg ability to draw down loan commitments in the future. This is associated with an incentive on the part of banks to fulfil obligations which bond markets are unable to provide credibly. In the fully underwritten loan there is a greater degree of commitment on the part of the lead bank than is observed in bond markets. Bank lending as well as bond issuance tends to be unsecured in the euromarkets, although bank finance covenants are stricter than bond covenants.

8 Conclusions

The implications for theory of the analysis of the euromarkets are that there is most support for control theory with some support for monitoring. In contrast there is little evidence to favour economies of scale or commitment. Commitment may be less important in the euromarkets than in domestic markets both because of intense competition between banks, which may impede commitment, and because of the more established reputations of firms allowing market as well as intermediated sources of finance to be accessed. However, even in the euromarket there is evidence that banks are able to offer some services (eg partial drawdowns) that are not available in bond markets.

The implications of this analysis for the relative significance of intermediated and other sources of finance is that bond finance and bank lending are not perfect substitutes even at the upper end of the market. Bank finance is still important for large firms because their riskier financings tend to be syndicated credits. This may in turn be justified by superior ability of banks to control failing companies.⁽¹⁴⁾

There is one common feature of both markets; euromarket financing is procyclical so that firms that are reliant on external finance may require other long-term relations in the less competitive domestic markets to tide them over during recession. International markets may be unable to provide the degree of commitment needed to offer countercyclical finance. As a consequence, there may be a further role for domestic bank finance that international markets are unable to satisfy.

(14) Some suggest that "global bond" issues, raised in several markets simultaneously, could entail an increase in the bond markets' ability to raise large sums. But it is not clear it would solve the agency problems of lending to companies - as is reflected in the fact that almost all global bonds so far have been either by supernationals or asset-backed.

Policy in a number of countries has been focussed on developing efficient bond markets, with some commentators suggesting banks to be almost redundant. The fact that banks play such an important role for large financings suggest these policies need to be balanced by concerns over the efficient operation of banking syndicates. For example, given the analysis suggests that control mechanisms are important, coordination in banking syndicates is required. The central bank may have a key role to play in this coordination, given the potential for free rider problems.

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