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**Industrial structure and dynamics of
financial markets; the primary eurobond market**

by

E P Davis

October 1988

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E P Davis

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The object of this series is to give a wider circulation to research being undertaken in the Bank and to invite comment upon it; and any comments should be sent to the author at the address given below.

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Abstract

The primary eurobond market is analysed using the approach of industrial economics. The investigation covers aspects of market structure, structure-performance relationships, the recently-developed theories of contestable markets and strategic competition, and industry dynamics. Certain features such as the tendency for excessive entry and for declining profitability during periods of growth or deregulation are interpreted in the light of the analysis. The results, although partly qualitative rather than definitive, offer insights into the behaviour of the market in question and of financial markets in general (including EEC markets after 1992). Suggestions are made for changes to regulatory and industrial policies in relation to financial markets.

* Indeed, much of the analysis is directly applicable to the UK and to domestic securities markets and the domestic market.

I INTRODUCTION

1 This paper seeks to analyse the nature and development of the industrial structure of the primary eurobond market. The study not only assesses the behaviour of the market itself, but also offers insights into the behaviour of financial as opposed to industrial markets, and of unregulated as opposed to regulated financial markets*. The eurobond market is relevant for these purposes because, in common with many industrial markets (but unlike most financial markets) it is globalised, relatively unregulated (though affected by deregulation of parallel national markets), features a strong presence of international firms and has witnessed a great deal of innovation. The industry has undergone a cycle of rapid growth, in terms of volume of issuance, which may now be levelling off.

2 Following a definition of the "price" and "product" of primary eurobond issuing activity and a discussion of other industrial characteristics of the eurobond market in general terms (Section II), the paper presents data on market structure, drawn largely from "league tables" of bookrunners. It is questioned whether the eurobond market is one market or several segmented markets, highlighting the primary problem for industrial economics of defining the market in question. Determinants of the demand for eurobond issues are assessed (Section III). These descriptive sections are then used as background for an analysis of the behaviour of the eurobond market. The analysis is based on traditional structure-performance relationships (Section IV) as well as the newer dynamic theories of industrial behaviour, notably those highlighting the importance of contestable markets and strategic competition (Section V). Although structure-performance relationships offer some insights, the approach of the "new industrial economics" appears to provide a better understanding of many of the distinctive features of eurobond market behaviour. A crucial reason for this is that traditional theory tends to assume that all firms are perceived as homogeneous by their customers, whereas in fact behaviour suggests that issuing services are seen as heterogeneous among suppliers. The new industrial economics is also relevant for interpretation of the causes of rapid entry to the market (Section VI). The results are then examined for their implications for policy issues which relate both to the eurobond markets themselves and to other financial markets (Section VII).

* Indeed, most of the analysis is directly applicable to the UK and US domestic securities markets and the euronote markets.

3 The main conclusions of the study regarding financial market behaviour are as follows:

- The key determinants of financial market pricing and profitability are the potential for successful new entry, the degree of regulation or protection, the strength of client relationships and elasticity of demand for the product - concentration indices are often poor indicators of industry performance;
- growing and deregulated financial markets are susceptible to rapid entry of firms, resulting in part from strategic manoeuvres. Excess capacity, resulting in an inefficient use of capital can occur, while accompanying intense competition may lead to dangers of systemic risk for the financial system;
- barriers to growth of firms in financial markets typically result from the existence of "sunk costs" arising from historical developments (relationships, placing power) and strategic competition (r&d, predatory pricing), both of which result in differentiation of intermediation services offered by different firms, rather than absolute capital needs. The cost of capital may however be another important determinant, and in some cases restrictive regulations by national authorities may play a part. Successful new entry to securities markets may require a pre-existing investor base in markets for similar financial instruments;
- the price elasticity of demand in unregulated financial markets is typically extremely high, resulting from a lack of market segmentation;
- rapid entry can result in a temporary self-sustaining growth of demand;
- client relationships are a key to understanding financial markets. These may weaken considerably when markets are liberalised or when the size of clients - and hence their countervailing power and access to information - increases relative to intermediaries;
- market analysis and r&d expenditures on product development in financial markets may be excessive because private returns to capturing a market often exceed social returns. As a result similar research is undertaken in many firms;
- for an individual firm it can be argued that there is a strong link between competition and risk in financial markets, which may have systemic implications.

II INDUSTRIAL CHARACTERISTICS OF THE EUROBOND MARKET

(a) The product and its price

4 In characterising the primary eurobond market as an "industry" it is useful first briefly to define the price and the product in question. The product is taken to be intermediation of eurobonds on behalf of borrowers. This always includes management, underwriting and selling of a bond issue, but may additionally entail arrangement of a swap, initial support for the price of the issue and an implicit commitment to make markets at a later stage. It is thus evident that secondary market trading cannot be divorced from primary issuance. (Firms may also feel the need to set up secondary market operations to build up relationships with investors, and to have an investor base for distribution of new issues.)

5 The price of eurobond intermediation is composed largely of commission or fees, which are divided between lead managers, underwriters and sellers. However, since managers can also offer a coupon for the bonds - and hence a yield - which is more or less competitive by taking a higher risk in underwriting, the overall price must also contain elements of the deviation of the yield from that which would be obtained from other competing intermediaries. A third cost element is the cost of ancillary services such as the swap fee. Finally, features such as initial market support will be reflected in fees and yields.

6 There are two important problems with these simple definitions of the product and price. First market behaviour suggests that intermediation services are not seen by investors or borrowers as homogeneous between intermediaries - an aspect which is noted in paragraphs 7-14, and analysed in Sections V and VI below. Second the concept of a eurobond "industry" itself is not unambiguous. Few firms specialise purely in eurobond issuance, and there may be elements of joint demand and joint supply between financial products, as evidenced by frequent use of "loss leader" tactics. However, the alternative to analysing the markets for individual financial products is to take the industry of finance as the smallest practicable unit of analysis, which is in our view undesirable. Nevertheless, the caveats to the primary eurobond market's "industry" status should be borne in mind in the analysis that follows.

(b) Description and stylised facts of the eurobond market

7 Eurobonds are generally bearer bonds issued offshore. They thus escape the various domestic regulations on bond markets, such as obligations to issue detailed

prospectuses*, issue queues**, and (in most markets) restrictions on firms lead-managing issues as well as withholding taxes and other fiscal provisions. Important features for industrial structure which differentiate the market from other financial markets are, first, that the market is globalised ie issuers and investors may be in any country, while intermediaries may be from third countries. It thus differs from most domestic banking markets and many domestic securities markets where savers, borrowers and intermediaries are typically also domestic. Second the market is relatively unregulated. For example, there are no barriers preventing activity by commercial or investment banks, indeed the eurobond market is characterised by a wide variety of types of firm and ownership structures (divisions of a firm, wholly-owned subsidiaries[≠]). In addition, there are no regulatory restraints against entry to the market and until recently there were no regulations for dedicated specific capital or prudential controls on players' activities, except (in the case of universal banks) to the extent that banking supervision of a company impinged on a eurobond operation[∅]. The absence of regulatory constraints has led many financial firms in the eurobond market to be multiproduct (financial conglomerates). The firms involved are often multinational in a way that is atypical of most other financial markets. Such a structure is much more typical of industrial markets such as those for cars and pharmaceuticals. The globalisation of the market and the absence of regulatory restraints are among the factors behind this tendency.

8 Like many industrial markets, the eurobond market has featured a variety of innovations as firms have sought actively to increase market share or create new markets by the introduction of attractive new financial products. Profitability of successful innovations has, however, typically been competed away as the product becomes a simple standardised product or "commodity". The eurobond market has featured rapid growth and new entry of intermediaries[≠], though also periods of consolidation. The market is currently facing a levelling-off of activity, with a continuing shakeout of spare capacity. As such, it provides an illustration of a rapidly changing financial market under little regulation, and thus may provide an example for the behaviour of other newly deregulated financial markets.

* Prospectuses are nonetheless generally issued as an aid to listing.

** Queues and certain other regulations remain in certain European markets.

≠ The firm or ownership structure is often determined by the firm's domestic regulation.

∅ Some tightening of regulation has resulted from the recent introduction of the Financial Services Act in the UK.

≠ This is not merely a recent phenomenon. Courtadon (1985) recorded a 23% increase in the number of lead managers between 1979 and 1983.

9 Certain other general features of the eurobond market are important for understanding its behaviour. As noted above, regulatory barriers do not constrain new entry to the market and rapid entry suggests that any other constraints to establishment in the market are weak. The distribution of successful firms, which includes various "niche players", suggests that entry at a low level of activity need not entail losses. As a result of these tendencies, the market structure of the eurobond market has generally been categorised as competitive - although such aspects as product differentiation, growth maximising strategies and the inability of a firm to gain infinite demand for its services if it sells at below-market prices* suggest imperfect rather than perfect competition (firms do not compete on price alone). However, despite rapid entry, there has been relative stability in the market share of the large established firms. This suggests that there may be barriers, which while not restricting entry per se, do restrict the ability of firms to become sizeable participants in the market.

10 What are the barriers to growth? First, capital needs are sizeable if firms wish to become major players, to invest in technology, to be able to handle underwriting and distribution, notably of "bought deals"^{**}, to hire expertise[‡] and to be able to trade and make markets. An institution which is already well capitalised or faces a low cost of capital will thus have an advantage. Among the other barriers to growth beyond a low level of activity appear to be the investor base and hence placing power of established firms, which influence the ability to win mandates. This partly depends on factors such as the strength of domestic demand for securities as opposed to deposits, together with restrictions on entry of foreign firms, which will give an advantage to indigenous firms. Strength of local demand for international securities will also often be correlated with the balance-of-payments surplus/deficit position of the country in which the firm or its parent is based as well as the strength and internationalisation of the currency. Given these change over time, the dominance of the industry by a certain nationality of institutions may be transitory. The expertise and capitalisation of the dealing desk, and the ability to innovate are also important factors though these may stem from the knowledge of the investor base. A more intangible barrier, partly a function of the other factors, is "franchise" or reputation of existing firms, the perceived ability in the mind of the client to deliver top quality services.

* On the other hand, the small size of issues and the large proportion which remain "locked" in accounts means that individual secondary market prices can often be manipulated by firms. The practice of "ramping" where firms buy up all of an available stock in order to profit from short sales by other firms is a typical example.

** Where the lead manager takes the whole of a bond issue onto his own books prior to placing the bonds with investors.

‡ Which in the case where the proportion of bonuses to salaries is low, bear many of the features of fixed costs.

11 The nature of demand for issuing services in the eurobond market is highly elastic and variable, due to the existence both of alternative markets for bond issue and of alternative instruments such as syndicated loans and euronotes. Issuers in the eurobond market are generally of high credit quality and therefore are not restricted on this basis from borrowing in other markets. Investors also have many alternatives to eurobonds in their portfolios. The main distinguishing feature of eurobonds is their bearer characteristic, but this is not likely to be important to the majority of bondholders such as institutional investors. Low liquidity of eurobonds compared with domestic bonds, particularly those denominated in dollars, makes them vulnerable to any fall off in demand from investors at times of financial stress.

12 Many commentators have suggested that eurobond market intermediaries are characterised by a managerial objective of growth maximisation, rather than short-run profit maximisation. As a result of strong growth, firms hope to become sufficiently large to make a "name" and thus attract new issuers and build placing power, an objective that may be felt to be consistent with long-term profit maximisation. The relative lack of entry barriers and large number of firms appears to lead firms to believe that growth maximisation is a feasible objective, although the barriers to growth outlined above mean that, in practice, the objective is difficult to attain. These tendencies have entailed certain structural problems - the market suffers from excess capacity, with many eurobond operations unable to make profits on turnover averaged over the interest-rate cycle (as evidenced by the recent retrenchment). Firms are often poorly capitalised, relative to their needs, as shown elsewhere by the difficulties of some securities firms resulting from their equity operations after the stock market crash, notably the need for injection of capital from parent banks. Undercapitalisation entails risks when such firms carry out eurobond "bought deals" or take on large positions in secondary market trading*.

13 Finally, it is emphasised that conditions in the eurobond market are subject to change over time, secularly as well as cyclically[‡]. Important long-term developments include the change of the customer base from individuals to institutions, and the increasing receptiveness of the latter to new currencies and instruments, the increase in volatility of exchange and interest rates, the advent of bought deals, deregulation of national securities markets, the declining segmentation of the different currency and instrument sectors of the euromarkets,

* It should be noted that in practice eurobond desks made gains on inventories at the time of the crash.

‡ These changes may be traced by comparing the successive descriptions of the Eurobond market in Geisst (1980), Levich (1985) and the Economist (1987).

the growing sophistication of corporate customers, financial innovation and unbundling of financial services. These changes - in particular the increasing size and sophistication of counterparties - have tended to increase competition between firms and hence the need for adaptability on the part of players, as well as reducing profitability.

14 To summarise, this section has discussed the key features of the eurobond underwriting industry, as well as introducing certain important aspects of industry behaviour ("stylised facts"). The latter are the main focus of analysis in the sections that follow. Among the most important "stylised facts" are the following: apparently highly, albeit imperfectly competitive market conditions; declining profitability; rapid entry with little effect on concentration (barriers to growth); growth maximising strategies on behalf of firms (long-run profit maximisation); a high level of innovation and periodic changes in the nationality of the dominant firms.

(c) Comparison with other financial markets

15 Table I offers a summary of these characteristics of the eurobond market together with the corresponding characteristics of other financial markets*. Certain contrasts are of particular interest, in particular, entry barriers differ between markets; entry to domestic markets is often regulated while some banking markets** can be difficult to penetrate in the absence of a retail deposit base. Growth in all banking markets has of late tended to be slow; though a distinction should be made between domestic banking markets which tend to be oligopolistic and the more competitive eurocurrency banking markets. These differences are reflected in ease of entry, and to a lesser extent managerial objectives. It is reasonable to aim for growth maximisation in the syndicated credits market[∅], while in many domestic banking markets the aim is rather market share. Some other markets also suffer from excess capacity, as for eurobonds, though non-performing debt is a problem largely confined to banking markets. It should be noted that many domestic securities markets are in a state of flux unlike the other three. The characterisation given in the table describes a traditional, closed securities sector (as in Japan and continental Europe) - many are evolving to be more similar to the euromarkets and adopting Anglo-Saxon financing techniques. Domestic banking markets in Europe may follow suit after further moves towards open and evenly regulated markets in the EEC.

* Obviously including some strong generalisations given the variety of market conditions in various countries.

** For a summary of barriers in international banking, see White and Vittas (1986).

∅ Although increasing capital requirements may tend to slow this trend.

TABLE I INDUSTRIAL CHARACTERISTICS OF FINANCIAL MARKETS

	Eurobond	Syndicated loans	Domestic banking	Domestic securities ¹
Barriers to entry or growth in the market	- swap capacity - innovation - investor base - dealing desk - lower in downturn of interest rate cycle - research into borrowers	- deposit base - syndication desk	- deposit base - domestic regulation - industrial firms may not participate - "relationships" - branch network	- regulation - client networks - analysis of local borrowers and instruments
Growth of market	- rapid till 10/87 (established and new products). Some recovery in 1988	- stagnant - some recovery recently	- stagnant	- rapid till 10/87 (largely established products)
Innovation	- high research expenditure and innovation - but basic products remain	- historically relatively little innovation, some more recently	- low	- fed from euromarket
Capital cost	- low for niche players - high for major players	- high (including banks' capital ratios)	- high (capital ratios and branch networks)	- low
Variable costs	- moderate (how fixed a cost is labour?)	- relatively low - high cost of deposits*	- relatively low - low cost of deposits*	- moderate
Demand for financial services	- highly elastic/variable - alternative markets - alternative instruments	- somewhat less elastic (inability of some borrowers to access bond market)	- relatively stable	- highly variable/elastic - alternative instruments
Market situation	- competitive - excess supply - low concentration	- competitive in euromarkets oligopoly at home	- oligopoly - high concentration <u>but</u> excess capacity	- oligopoly high concentration in most markets
Diversification of activities	- high	- high	- depends on country	- low
Regulation	- low	- low except capital ratios	- high (all aspects of activity)	- high
Properties of instruments	- Transferable but low liquidity in many issues - Low transactions costs	- Largely non transferable (though recently-developing secondary market for loans) - Low transactions costs	- Largely non-transferable - High transactions costs	- Moderate liquidity - High transactions costs
Advertising expenditure	- Low	- Low	- High	- Low/moderate
Structural problems	- Excess capacity	- Non-performing debt - Excess capacity	- Excess capacity and non-performing debt	- Excess capacity
Managerial objectives	- Growth maximisation/market share, new business	- Growth maximisation	- Profitability/market dominance	- Market dominance/profitability
Mergers	- common	- rare	- rare	- common
Scope of market	- world	- world	- domestic	- domestic

¹Applies to markets such as the Japanese and continental European markets; the US (and UK) markets resemble the eurobond market more closely.

*The cost of eurocurrency deposits is typically above that of domestic deposits - but loans in either market draw on a common pool of funds.

III THE INDUSTRIAL STRUCTURE OF THE EUROBOND MARKET

16 Industrial structure is conventionally described in terms of the degree of firm concentration and product differentiation [see Hay & Morris (1979)], though the elasticity of demand is an important underlying factor.

(a) Concentration

17 The market has undergone the evolution shown in Table II (as recorded by "league tables" of lead managers^Ø in the primary market for all eurobond issues[†] ranked by the value of issues lead managed in dollar terms). The five-firm concentration ratio has varied around an average of 41% over this period, rising to a peak of 53% in 1978 before falling to 34% in 1980, rising to 47% in 1983 before declining to 36% in 1987. Broadly, the declines in the concentration ratio have tended to occur during periods of market growth, while the rises have corresponded to recessions, suggesting that high levels of bond issues lead to a more even spread of issues between firms as well as new entry, while in slack periods the dominant houses tend to take a larger proportion of issues, smaller houses being squeezed out. It is notable that the level of concentration in 1987 was not unprecedentedly low, but instead comparable with the previous trough in 1979-81. It is also apparent that examination of such a long period is essential to avoid erroneous conclusions regarding concentration. For example Courtadon (1985), concentrating on the period 1979-83, concluded that concentration was in a period of long-term increase.

18 An alternative measure of industrial structure is the Herfindahl Index* which has the advantage of reflecting both the number of firms and their relative size [see Hannah & Kay (1977)]. The reciprocal of the H-index gives a measure of the number of equal-sized firms that give the same value of the index: in this case an average of 19. As regards changes over time, the Herfindahl index suggests similar trends in concentration to the five-firm ratio, with peaks in 1978 and 1983. Concentration has been slightly lower in 1981-87 (0.054/19) than in 1975-80 (0.059/17) although it was actually higher in 1987 than in 1979-80.

19 Other indications of eurobond market structure can be obtained by examining the number of firms with over 5% of issues, and the number with over 1%. The number over 5% moves similarly, but not identically to the concentration ratio, with peaks in 1977 and 1984-85, though a high number was also recorded in 1975. The number

Ø Sources: Bank of England ICMS database, International Financing Review, Euromoney

† Courtadon (1985) gives data on concentration for 1979-83 for the different instrument sectors.

* Defined as $H = \sum s_i^2$ where s is the share of each firm in industry output.

with over 1% has tended rather to increase over time - suggesting new entry - from an average of 21 in 1975-79 to 27 in 1980-84 and 26 in 1985-86. In 1987 this total has declined to 22, which may be the first harbinger of the shakeout in the market.

20 It is relevant to compare market concentration in the eurobond market with other financial markets, because it enables one to rank the markets in terms of concentration and assess concentration's possible effect on performance. The Economist (1985) shows that in the primary US domestic bond market, the five-firm concentration ratio as measured by shares of underwriting was 23.7% between January 1981-April 1982, while in the period May 1982-September 1984, it rose to 45%*. Appendix I, drawn from Revell (1987b) shows concentration ratios for banks in various advanced countries. In general, the five-firm concentration ratio tends to exceed the eurobond market's average of 41% for "commercial banks" only, but not for "all banking institutions". Concentration in the UK is lower than 41% for both sectors.

21 The nationality of the top five lead managers in the eurobond market has changed significantly over this period - in itself an indicator of the intense competition prevalent in the market. German and Swiss lead managers were dominant between 1975-79, but US houses became increasingly important during the 1980s, and by 1984-85 three US houses and the US/Swiss CSFB were included in the first five. The dominance of the US houses was, however, broken by the entry of the Japanese, with one in the top five in 1986 and three in 1987.

TABLE II PRIMARY EUROBOND MARKET CONCENTRATION

	5-firm pro- portion	Herfin- dahl index*	Numbers equiva- lent	No over 5%	No over 1%	Nation- ality of top 5	Issues \$ bn	Issues (1987 prices)	Annual real percent increase
1975	40	0.052	19	8	21	G,US,B,G,S	18.1	35.8	-
1976	46	0.065	15	4	20	G,S,US,UK,N	29.6	55.1	+53.9
1977	47	0.063	16	6	19	G,S,G,S,G	29.3	51.3	- 6.9
1978	53	0.091	11	5	24	G,G,N,G,S	31.2	50.9	- 0.8
1979	36	0.044	23	3	24	S,G,G,G,US	37.3	55.6	+ 9.2
1980	34	0.039	26	4	29	S,G,UK,US,F	38.1	52.2	- 6.1
1981	38	0.047	22	4	27	S,UK,US,G,US	48.3	60.4	+15.7
1982	44	0.058	17	3	27	G,S,US,US,US	74.3	87.3	+44.5
1983	47	0.079	13	2	25	S,G,UK,US,G	73.9	83.5	- 4.3
1984	43	0.058	17	6	27	S,US,G,US,US	108.4	118.3	+41.7
1985	37	0.048	21	6	29	S,US,US,US,G	164.5	173.9	+47.0
1986	36	0.043	23	4	28	S,JP,G,US,US	221.5	228.1	+31.2
1987	36	0.043	22	5	22	JP,S,G,JP,JP	175.6	175.6	-23.0

*Based on shares of the top 20 firms

Key: G: Germany; F: France; S: Switzerland; N: Netherlands; JP: Japan
B: Belgium; US: United States

* The change was attributed to the advent of shelf registration, which facilitated use of bought deals, and favoured investment firms which had capital and distribution networks, since these would enable firms to take on issues and place them with investors.

22 New entry to the industry has been frequent; the total number of bookrunners has risen sharply since 1980 and 43 firms have entered the top 50 issuers since 1975^Ø while 14 firms have gained positions in the top 10 lead managers for the first time (see Table III). However, very few have been able to maintain these positions: only 2 in the top 50 and 3 in the top 10. This suggests that while entry to the eurobond market is easy, it is more difficult for a firm to establish itself as a dominant player.

TABLE III INDUSTRIAL DYNAMICS OF THE EUROBOND MARKET

	New entry to top 50 (of which durable)*	New entry to top 10 (of which durable)*	Memo: total number of bookrunners
1976	∕	∕	n/a
1977	9	0	n/a
1978	10	3	n/a
1979	2	1	n/a
1980	5	1	108
1981	5	4	102
1982	3	2(1)	115
1983	2(1)	1(1)	115
1984	1(1)	0	110
1985	0	0	129
1986	1	1(1)	144
1987	4(∕)	1(∕)	138

∕ Omitted

* ie always in the relevant section after entry

23 There have been 112 firms in the top 50 since 1975, but of these only 16 (14%) have been consistently in the top 50 (see Table IV). To these one can add the two new entrants who have established themselves to give a set of "core players" amounting to 18(16%). Obviously there are others on the fringes of this group who have dropped out for 1-2 years (an extra 12 firms) but this leaves a large number who are at most transient players. Of these two sets of firms, 11 have never been in the top ten, and can be classified either as niche operations or unsuccessful

^ØThe calculation commences in 1977 to allow for firms temporarily absent from the top 50 in 1975 only.

major players. In addition, 4% have managed only one issue in the relevant period, and no less than 39% have been in the top 50 for less than four years, excluding those who have established themselves in the last four years. These data suggest that there is a durable core of banks and securities houses whose position is hard for other banks to challenge*.

TABLE IV SUMMARY OF FIRM ACTIVITY

	no	%
Total firms in top 50 1975-87:	112	
of which (i) always in top 50:	16	14%
(ii) only dropping out for 1-2 years since entry:	12	11%
(iii) firms in groups (i) and (ii), never in top 10 - either niche firms or unsuccessful entrants	11	10%
(iv) firms having made only one issue:	5	4%
(v) in top 50 less than 4 years, not there in 1987*:	44	39%

*To allow for those firms which entered successfully four years ago.

(b) Product differentiation; One market or several?

24 The second aspect of industrial structure is product differentiation. The above data and discussion have broadly assumed that the eurobond market is one market and has been since 1975, in the sense that borrowers can freely substitute between currencies. It has also been assumed that all eurobond instruments are comparable while firms can compete for mandates for all borrowing country and currency sectors.

25 These assumptions are oversimplified. From the point of view of the borrower, all eurobond sectors do not share the same characteristics[†]. One obvious difference is the coupon, which varies according to prevailing domestic interest rates in the country in question. Expectations regarding changes in the exchange

*However, it is noted that these data are also consistent with an equal chance for each firm to drop out in each year. If the probability of dropping out is 0.9, then 16 firms would be consistently in the table. The suggestion here is rather that some firms ("incumbents") have low probabilities, all the others very high probabilities.

[†]In the sense of Lancaster (1971).

rate are clearly also relevant for foreign investors. In principle covered interest rate parity should tend to equalise differences in costs - in practice this often tends not to hold for long-term rates. In addition the relationship between euro and domestic rates tends to vary between markets. Such factors as seasoning rules, taxation, liquidity, bearer status, usage of credit ratings, the placing power of domestic institutions and the mix of borrowers underlie these cost differences. The perception of the borrower by investors, and hence the spread, may differ between markets. Some borrowers may be constrained in the markets in which they borrow - UK building societies, for example, were initially permitted only to issue in sterling. Finally, eurobonds themselves are often not standardised commodities - investment banks are constantly inventing hybrid investments with characteristics that are not homogeneous with other eurobonds in the same currency.

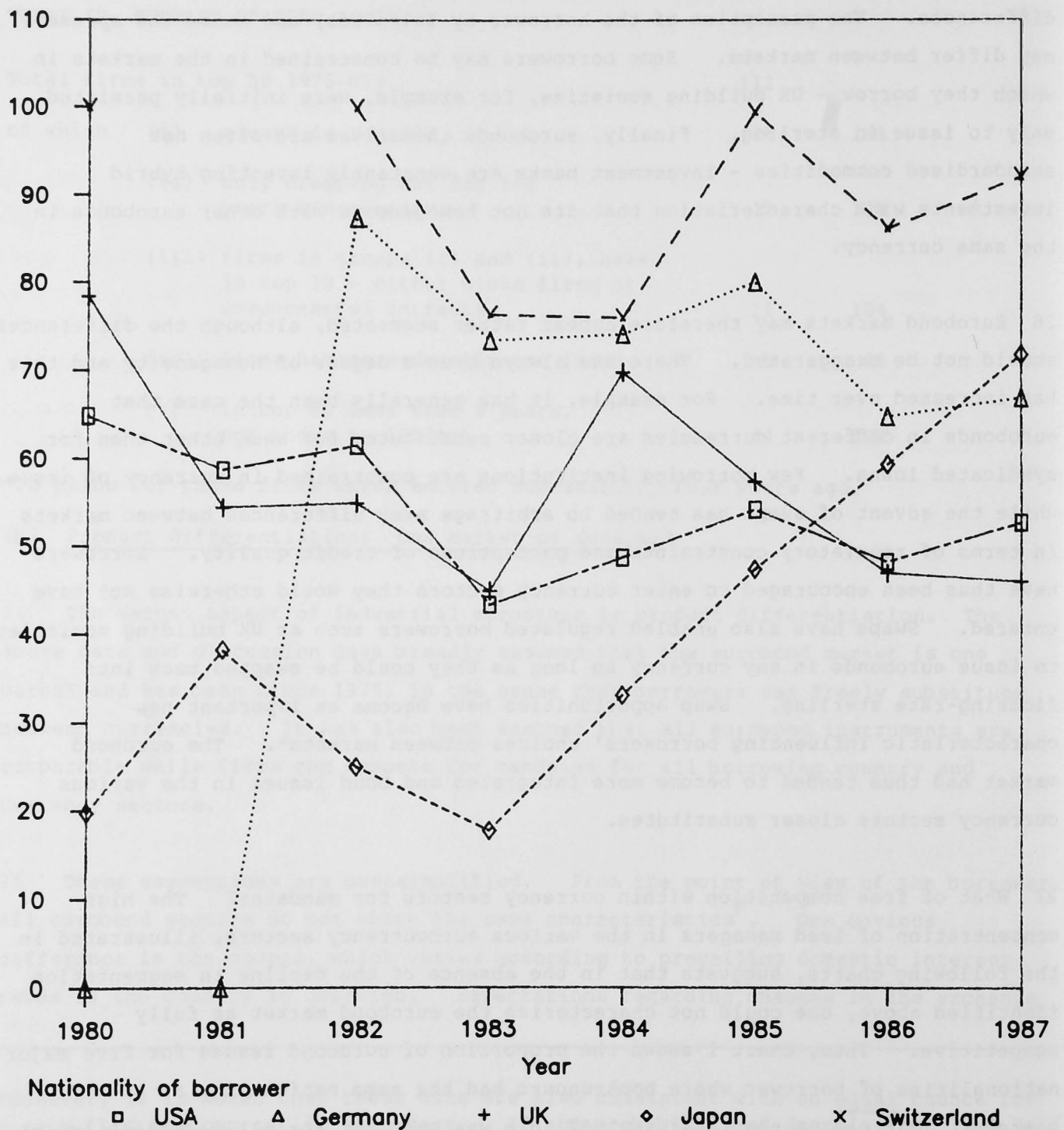
26 Eurobond markets may therefore appear rather segmented, although the differences should not be exaggerated. There has always been a degree of homogeneity and this has increased over time. For example, it has generally been the case that eurobonds in different currencies are closer substitutes for each other than for syndicated loans. Few borrowing institutions are constrained in currency of issue, while the advent of swaps has tended to arbitrage away differences between markets in terms of regulatory constraints and perceptions of credit quality. Borrowers have thus been encouraged to enter currency sectors they would otherwise not have entered. Swaps have also enabled regulated borrowers such as UK building societies to issue eurobonds in any currency so long as they could be swapped back into floating-rate sterling. Swap opportunities have become an important new characteristic influencing borrowers' choices between markets*. The eurobond market had thus tended to become more integrated and bond issues in the various currency sectors closer substitutes.

27 What of free competition within currency sectors for mandates? The high concentration of lead managers in the various eurocurrency sectors, illustrated in the following charts, suggests that in the absence of the decline in segmentation identified above, one could not characterise the eurobond market as fully competitive. Thus, Chart 1 shows the proportion of eurobond issues for five major nationalities of borrower where bookrunners had the same nationality as the borrower. It can be seen that in 1987 this was over 50% for all countries except

* Though an important constraint on the growth of swaps in many currencies has been limited availability of hedging of intermediaries' inventories of swaps via futures markets.

Chart 1

Proportion of total eurobond issues by major nationalities of borrower, having a bookrunner of the same nationality as the borrower

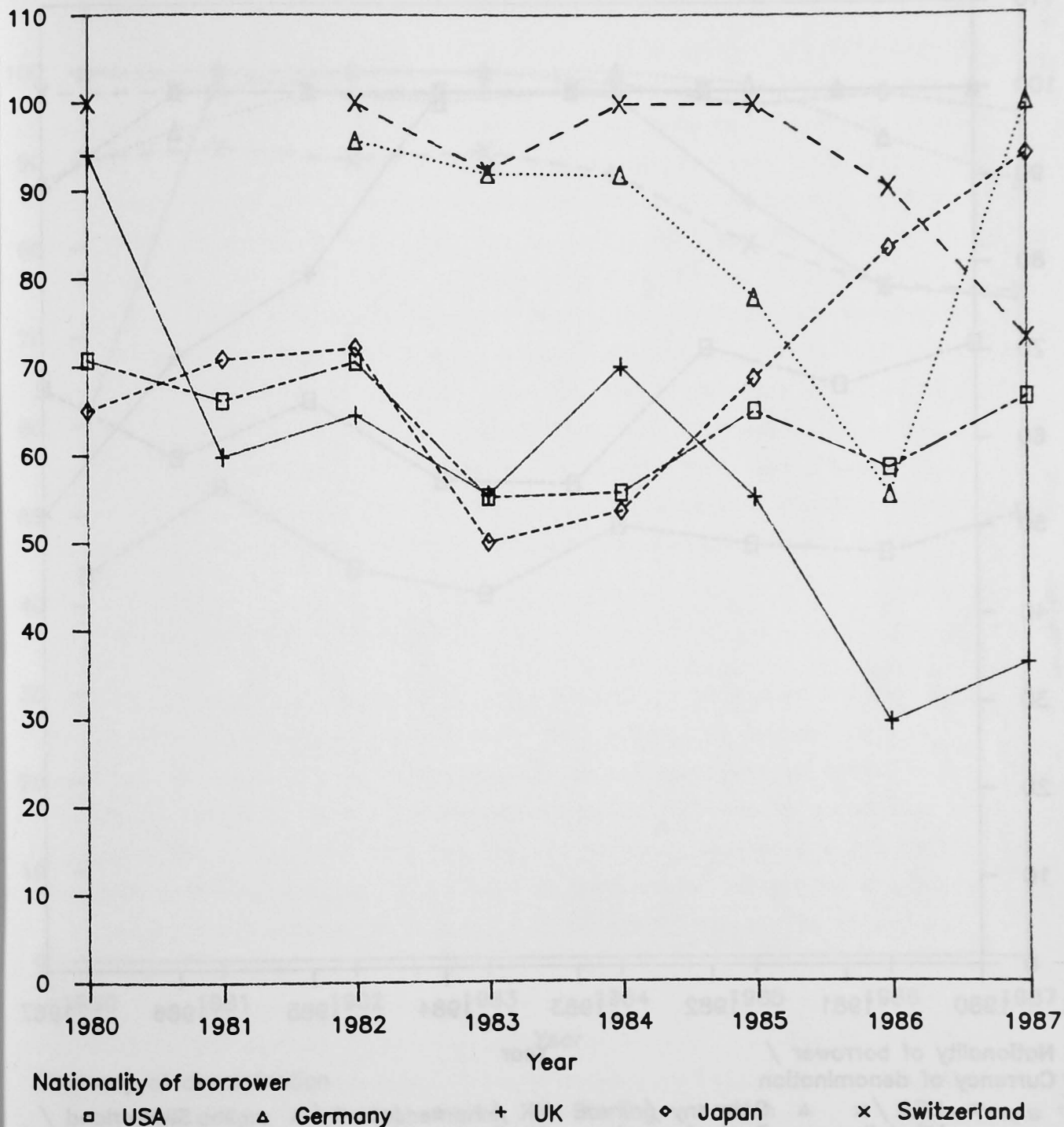


Source : Bank of England ICMS database

Chart 2

Proportion of US dollar eurobond issues by major nationalities of borrower, having bookrunners of the same nationality as the borrower

Percentage

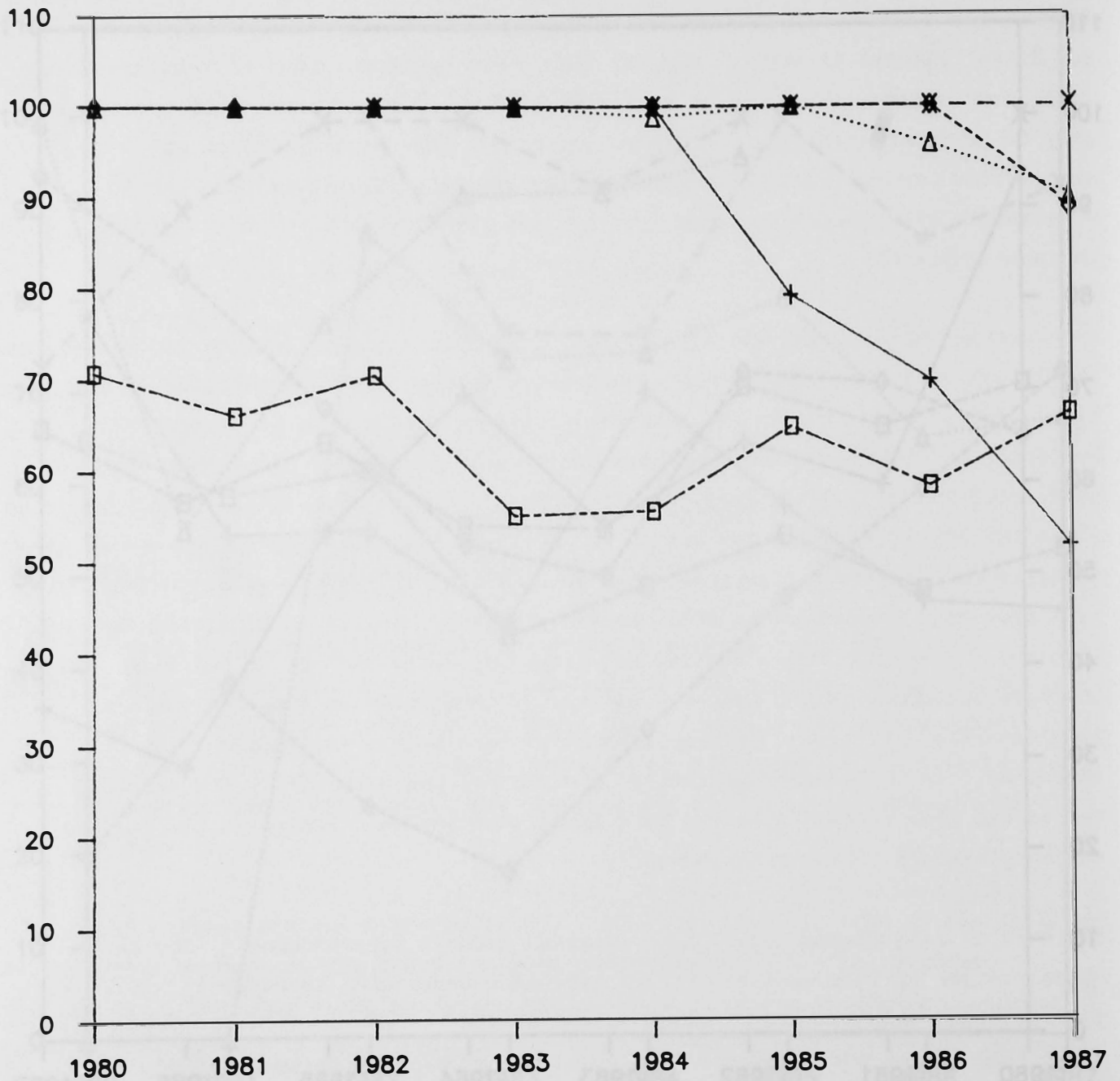


Source : Bank of England ICMS database

Chart 3

Proportion of eurobond issues for borrowers in their domestic currency, led by banks of the same nationality

Percentage



Nationality of borrower /
Currency of denomination

Year

□ USA /
US dollars

△ Germany /
Deutsche marks

+ UK /
Sterling

◇ Japan /
Yen

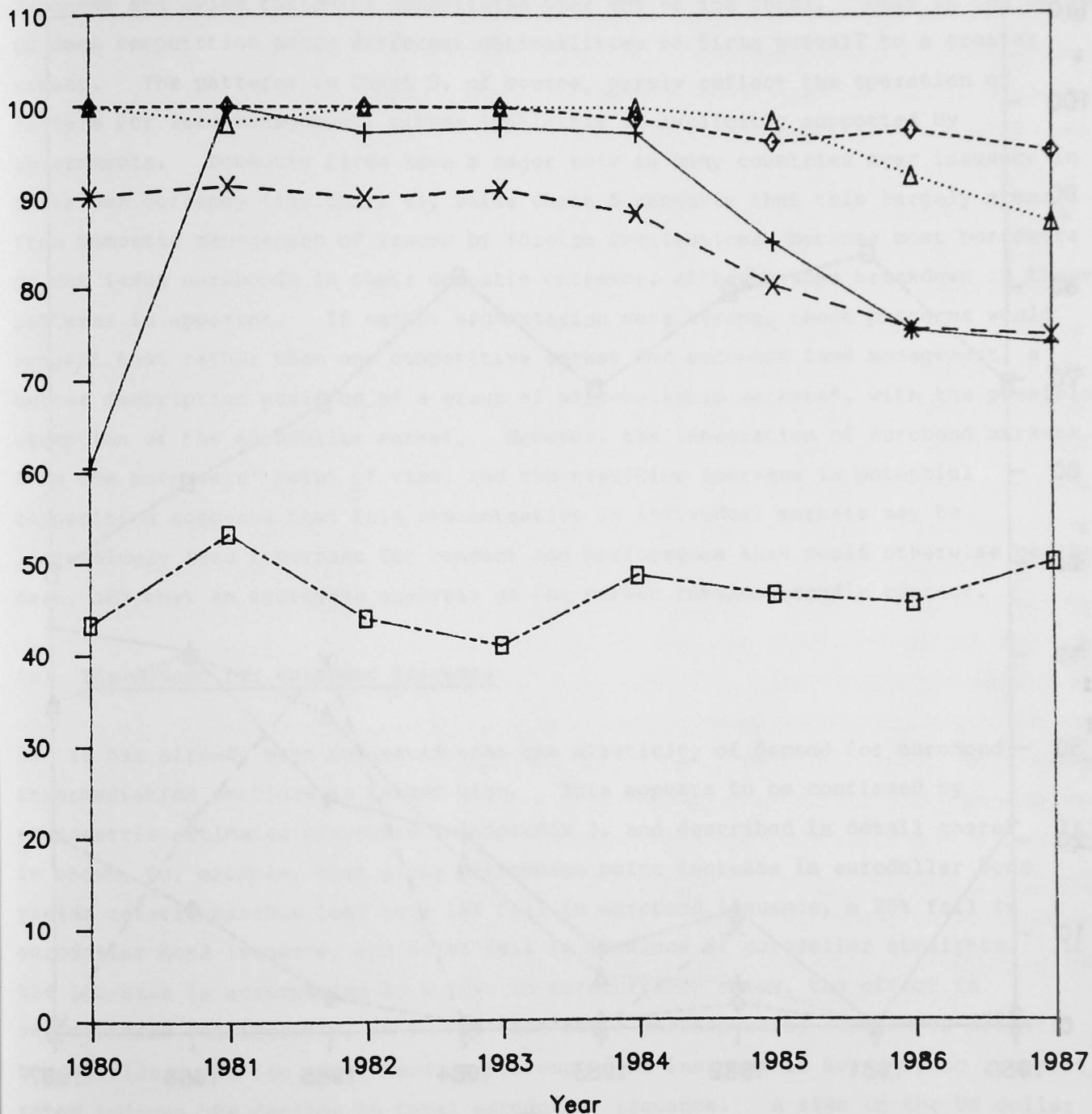
× Switzerland /
Swiss francs

Source : Bank of England ICMS database

Chart 4

Proportion of eurobond issues, by currency of issue, denominated in the lead bank's domestic currency

Percentage



Currency of denomination

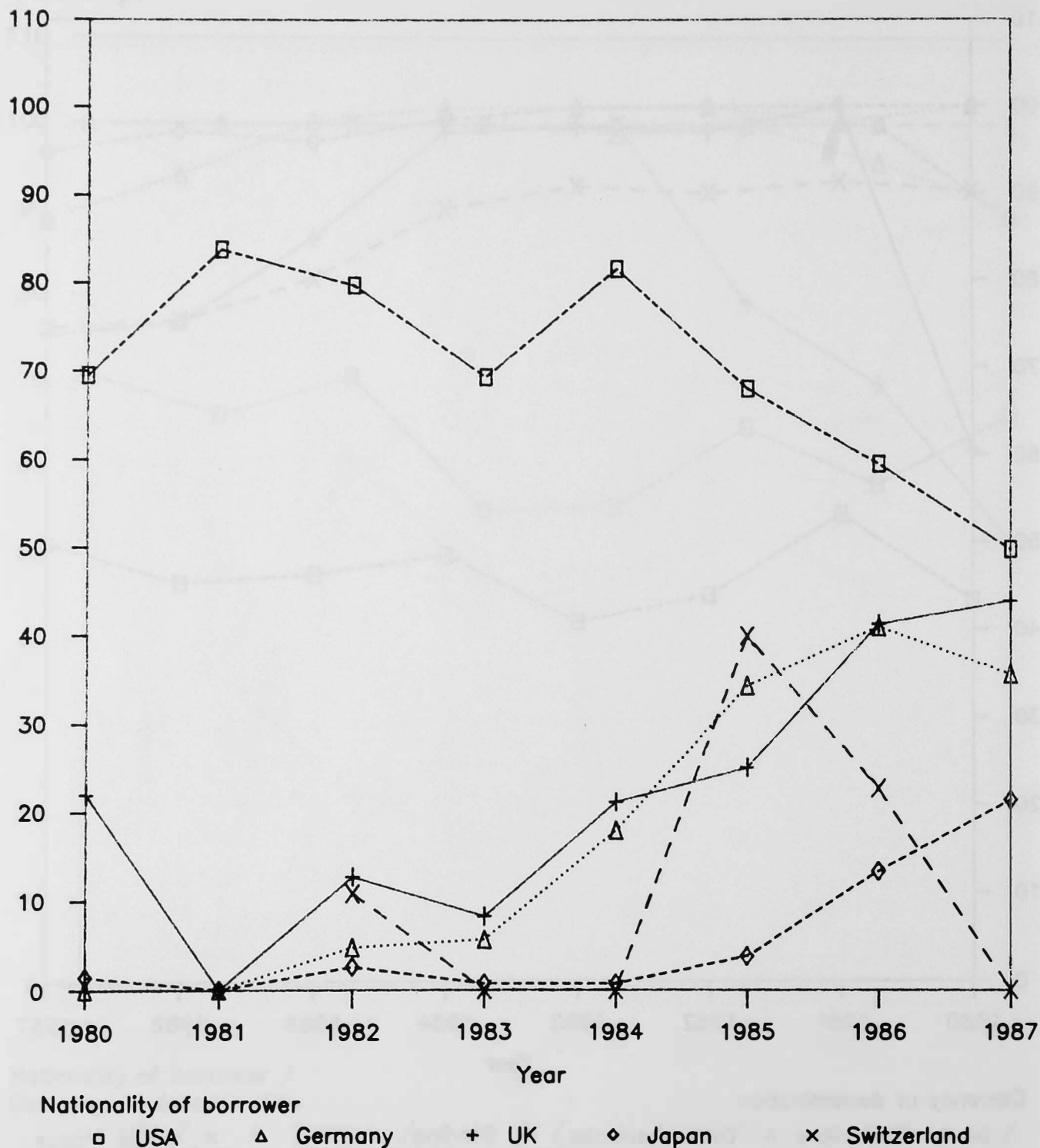
□ US dollars Δ Deutschemarks + Sterling ◇ Yen × Swiss francs

Source : Bank of England ICMS database

Chart 5

Proportion of total eurobond issues by major nationalities of borrower, denominated in their domestic currency

Percentage



Source : Bank of England ICMS database

the UK, while for Germany, Switzerland and Japan over 2/3 of issues were run by domestic institutions. Similar conclusions hold for eurodollar bonds; over 60% of bookrunners were domestic in 1987 for all countries except the UK (see Chart 2). This is even more the case for eurobond issues in the domestic currency of the borrower, as shown in Chart 3, where domestic firms' intermediation of German, Japanese and Swiss borrowing constitutes over 90% of the total. Only in the UK and US does competition among different nationalities of firms prevail to a greater extent. The patterns in Chart 3, of course, partly reflect the operation of cartels for lead management, either implicitly or explicitly supported by governments. Domestic firms have a major role in many countries over issuance in their own currency (see Chart 4), while Chart 5 suggests that this largely stems from domestic management of issues by foreign institutions, because most borrowers do not issue eurobonds in their domestic currency, although some breakdown in these patterns is apparent. If market segmentation were strong, these patterns would suggest that rather than one competitive market for eurobond lead management, a better description would be of a group of oligopolistic markets*, with the possible exception of the eurodollar market. However, the integration of eurobond markets, from the borrowers' point of view, and the resulting increase in potential competition suggests that this concentration in individual markets may be increasingly less important for conduct and performance than would otherwise be the case, and that an aggregate analysis of the market remains broadly correct.

(c) The demand for eurobond issuance

28 It has already been suggested that the elasticity of demand for eurobond intermediation services is rather high. This appears to be confirmed by econometric estimates presented in Appendix 3, and described in detail there. It is shown, for example, that a one percentage point increase in eurodollar bond yields ceteris paribus lead to a 16% fall in eurobond issuance, a 20% fall in eurodollar bond issuance, and a 19% fall in issuance of eurodollar straights. If the increase is accompanied by a rise in eurocurrency rates, the effect is strengthened considerably, as is the case for a corresponding rise in US domestic bond yields. On the other hand, a corresponding increase in Swiss franc interest rates reduces the decline in total eurodollar issuance. A rise in the US dollar exchange rate stimulates issuance - the exchange rate being of course a key

*This need not imply low competition within the cartels. Studying the groups forming management syndicates, Mendelsohn (1983) noted a considerable degree of switching.

component of the return for a foreign investor. The level of issuance is also strongly dependent on the level of economic activity (proxied by US industrial production). There is, however, little evidence of persistent effect of lagged variables. These results illustrate the sensitivity of eurobond issuance to yields and yield differentials as well as relative exchange rates. A strong elasticity of substitution between dollar and Swiss franc eurobonds is implied, while issuance increases with a steepening of the euromarket yield curve*. The lack of long-term effects shows an absence of habits and inertia in the primary eurobond market, a characteristic that one would expect in a wholesale financial market. ^ø

IV THE EUROBOND MARKET AND TRADITIONAL STRUCTURE-PERFORMANCE RELATIONSHIPS

29 The traditional approach to industrial economics may be characterised as the structure-conduct-performance approach [see, for example, Bain (1956)]. The key to understanding and predicting the performance of an industry in terms of profits, growth, technical progress etc is found in the industrial structure. Structure is defined to include concentration, (ie the relative and absolute size of firms) and product differentiation, as well as ease of entry and elasticity of demand for the output of the industry. Thus it was shown above that the eurobond market features high concentration, declining segmentation between eurobond sectors and a high elasticity of demand. Conduct, which covers aspects of firm behaviour and objectives, in turn generates the performance of the industry in terms of profitability and pricing. In practice examination of conduct is often minimal and direct links are assumed between structure and performance. Profit maximisation is assumed as the objective of performance, and firms are seen both as passive agents and homogeneous (ie there is no distinction in the mind of the customer between similar goods or services offered by different firms). Dynamic aspects (growth of the firm, penetration of new markets) are largely ignored. It is suggested in section V that these assumptions explain the weakness of structure-performance relationships in explaining the behaviour of the eurobond market.

30 At the simplest level, through the use of concentration and other structural factors, it is possible to categorise industries as being in a state of perfect competition, monopoly, or at some gradation between. The point on the spectrum can be used to make predictions regarding performance, in particular relating to

* It should be borne in mind that the estimation period largely covers a time of falling long-term rates.

ø By contrast, Davis (1986) found strong inertia effects in the demand for financial assets by the personal sector in four major economies.

profitability[†]. The basis of this is that in atomistic competition when there are many firms, individual firms are unable by their own actions significantly to influence the price of the product. Power over pricing is assumed to increase inversely with the number of firms.

31 Industrial concentration is typically taken as exogenous and beyond individual firms' control. An important determining factor is the ease of entry, notably the capital required by a potential competitor to set up in business to challenge existing firms*. An increasing minimum efficient scale is seen as raising the level of monopoly, ceteris paribus. Other barriers, which are of relevance in many financial markets, include legal restrictions or regulations, often imposed or approved by governments. The growth rate of the market, and the size of the market have also been found in various studies to influence concentration in an inverse manner, while there is a positive relationship between expenditure on advertising and concentration.

(a) A priori application of theory

32 Applying this theory at its most basic level, one may begin by attempting to come to a view on concentration in the eurobond market. The average five-firm concentration ratio over 1975-87 was 41%, which is greater than the majority of UK manufacturing industries (see Appendix 2) and shows no secular downward trend. What sort of performance should be predicted? Several factors might lead one from this observation to a judgment that concentration is "high". First there are typically not felt to be strong economies of scale in finance, at least for individual products[∅], unlike manufacturing ie concentration is not high because of economies of scale, but rather in spite of the lack of them[‡]. The

† For example Hay and Morris (1979) reported that the profit rate for US industry in the 1950s ranged from 9.9% (low entry barriers) to 16.4% (high barriers) and from 12.5% (all industries) to 13.1% (high concentration). Such a pattern suggests an additional role for potential entry in low barrier, high concentration industries.

* The existence of such a barrier assumes some imperfection in capital markets.

∅ It is often suggested that there are economies of conglomeration - joint costs and joint demands between products. This point is discussed further in the sections below.

‡ There are some counterarguments for eurobonds, however. If competitive pricing of new issues and successful distribution at a profit requires a strong secondary trading arm, then the larger the secondary market side, the more competitive the firm. Research (in the sense of market analysis) is an important instrument for gaining such an investor base, which since it is a high fixed cost can only be carried out by large firms. A similar case can be made for r&d on the borrower side (developing new instruments). It can be argued that expenditures on analysis and product development will often be excessive in financial markets (see Section V and Appendix 5).

coexistence of small (Wood Gundy, AB Netherland) and large (CSFB, Nomura) firms is evidence that the average cost curve of the eurobond industry, at least beyond a certain initial capital required for viability, is relatively flat*. [On the other hand it should be noted that human capital may be both expensive and quasi fixed (due to contracts, bonus proportions etc)**.] Second eurobond issue is a world industry. Even the most capital intensive manufacturing industry would typically have a lower concentration ratio evaluated on the global scale (though clearly in many cases transport costs, tariffs etc mean the world is not the relevant market). Third the pattern of concentration in individual sectors shown above suggests at least some potential for collusion. On the basis of the relatively high concentration ratio, one could expect excess profits and collusive behaviour, manifested in high prices and costs for issuers.

33 On the other hand, theory predicts that such monopolistic behaviour will be more evident where there are no close substitutes. As was shown above, there is a high elasticity of demand for total eurobond issuing facilities and there are other financial instruments which are substitutes for eurobonds from the point of view of borrowers. This has been increasingly so with the deregulation of financial markets. Entry as a niche player is on the face of it fairly easy. It was also suggested that market segmentation between the currency sectors is not a strong influence in anything but the short term with the advent of swaps. The cross-elasticities of demand for eurobond issuance between sectors are rather high. It should also be noted that the identity of the largest firms changes over time, which implies lower possibilities of collusion than if they remained the same. The performance of the industry in a static sense is evaluated below in the light of these offsetting factors.

(b) The nature of competition

34 In order to examine the performance of the eurobond market, it is necessary first to consider the nature of competition in the market. Eurobond houses typically compete[†] for mandates in various ways. They may try to offer the

* An application of the survivor technique [Stigler (1958)], which infers the shape of the cost curve from the distribution of firm sizes which are able to "survive" in an industry.

** Studies of banking in the US found relatively few economies of scale in operating expense (see Gilbert 1984): though large banks with balance sheets over \$1 bn tended not to be covered. They did find evidence of joint costs.

† This discussion relates to short-run competition between firms already in the industry. Section V highlights longer-term dynamic aspects of competition.

most attractive swaps, low spreads over domestic bonds, low commissions (including underwriting fees) and primary and secondary market support. The locus of competition may change over time; however, in general the interest cost, gross of fees, may be defined as the price of a eurobond issue to the borrower, and is the continuing obligation in relation to the bond issue. The level of general interest rates is clearly beyond the control of intermediaries, but commissions can be trimmed and, more frequently, yields at issue can be varied by an increase in the risk taken by underwriters. The cost of a swap may also be varied. Out of pocket issue fees, including legal, printing and fiscal agents fees tend to be small; in extreme cases differences in them can sway deals, but in general the yield, commission cost and cost of the swap (if included) remain primary factors. Finally, ability of the investment bank to maintain a secondary market is important to the extent that repeat borrowing will tend to be priced on the basis of the yield on outstanding issues.

35 Offered prices will not necessarily always cover costs - firms may often sacrifice short-run profit maximisation to be included in a deal*. Such behaviour results from the importance of "league tables" in attracting further primary eurobond business and "relationships" with issuers, the existence of "joint demand" for different products from the same firm - and possibly also joint costs in the production of different services. Indeed, primary eurobond operations are often categorised as "loss-leaders", making low or negative profits to attract clients to other operations (equity issuance, financial advice, bank lending etc) or to penetrate new markets. For example, intermediaries may be prepared to offer deals at times when other firms are unable to do so, taking the risk of putting a deal on their own books.

36 In the light of the above discussion, spreads, commissions and profitability are examined below for evidence of industry competitiveness. However, another feature of competition noted here should be highlighted - the link between competition and risk for an individual firm[∅]. Management and control of risk are central to the functioning of financial institutions, and the main impetus to the development of intermediaries are economies of scale associated with risk management [Revell (1987a)][†]. Risks in securities underwriting are of a particularly acute and

* This will be particularly the case when firms are trying to penetrate new markets. Clearly, a theory which assumes profit maximisation will have difficulty explaining these tendencies.

∅ This is arguably greater for financial than industrial firms due to the weakness of the takeover sanction and perceptions of socialisation of risk - that governments may support failing financial institutions. Together these may lead to higher debt-equity ratios and inadequate risk-adjusted rates of return.

† The other main impetus - now fading in importance in wholesale markets - comes from economies of scale in information gathering (see Section V).

short-term nature. The operations of euromarket managers typify these tendencies - management, underwriting and sale of an instrument whose value is vulnerable to changes in interest rates. Also, however, they appear, due to competitive pressures, often not to obtain sufficient profit to cover risk*. Thus, for example competitive eurobond firms carry out "bought deals" on very narrow spreads, with low implied risk premia and paradoxically, many firms have only recently begun calculating measures of the risk-adjusted rate of return for various activities. Although hedging in the cash or futures market can offset some of the risk, eurobond market hedges (for example US Treasury bond futures) are often imperfect. Price stabilisation in the "grey market" is vulnerable to general changes in interest rates. As well as taking risks at issue, firms often hold large inventories of bonds on their books for trading and own-account holding - the latter can also sometimes offset losses in the primary issue market.

37 These risks are present in all financial markets but may be particularly severe in the primary eurobond market due to its auction style nature and the "lumpy" nature of the commodity. Such a market may be more susceptible to price overshooting than in the case of a continuously priced market for "divisible" products such as industrial products and bank deposits. The competitiveness-risk link means that high levels of competition may not be an unmixed benefit for the market as a whole. Since there are externalities to failure of financial firms - doubt may be cast on the creditworthiness of others**, for example - an increase in competitiveness may entail risks of systemic instability. However, the risk of failure of a firm is mitigated to the extent that risks are adequately hedged and the eurobond business is a subsidiary of a well-capitalised conglomerate.

(c) An assessment of conduct and performance

38 An assessment of commissions in international bond markets in the early 1980s shown in Appendix 4 suggests that in general, commissions in the eurobond market were higher than in the US domestic market, but rather lower than in the various European domestic markets. Levich (1985) suggested that large selling commissions

* One way of interpreting this tendency is to say the firms in conditions of increased competition are forced to shift up their risk-return tradeoff in order to remain viable.

** It can be argued that this form of externality is unique to financial markets, though others (eg effects of bank failure on local firms) are common to failure of both financial and industrial firms.

were required to induce European banks to participate in deals. On the face of it, such high commissions suggest a lack of price competitiveness, but Levich suggested that large institutional buyers are able to force distributors to share all or part of the selling concession, and prices may thus be lower than they appear*. This is shown by prices in the "grey market", which are often reported to be so low as to negate all of the gross fees thus absorbing all of the underwriters' risk premium. Firms are then only able to make money by stockpiling inventories and reselling when (if) interest rates decline.

39 Average commissions on eurobonds have declined, albeit irregularly, since 1980 (see Table V). Although a parallel shift in average maturities[†] means that part of the fall is not accounted for by increased competition, comparison of years with similar average maturities does show a decline in gross fees. Over 1980-83 the average level of gross fees for supranational issuers (ie controlling for credit quality) was 1.98 while over 1984-87 they were 1.65. The decline for management and underwriting fees has been more rapid than for selling, suggesting greater increase in competitive pressures in management and underwriting. Over the same periods they have fallen from 0.67 to 0.50 compared with 1.31 to 1.15 for selling. Commissions in the eurodollar market as a whole (not illustrated) obviously depend on maturities and the quality of the issuer, but similar trends in fees are observable.

TABLE V AVERAGE COMMISSIONS ON EURODOLLAR FIXED-RATE BONDS FOR SUPRANATIONAL ISSUERS

Year	Percent Gross fees	Selling	Management/ underwriting	Memo: average maturity (years)
1980	2.50	1.5	1.0	9.1
1981	1.81	1.25*	0.56	6.8
1982	1.72	1.25	0.47	7.9
1983	1.87*	1.25*	0.62*	7.5
1984	1.55	1.05	0.5	9.3
1985	1.75	1.12	0.62	12.4
1986	1.89	1.29	0.60	14.3
1987	1.42	1.16	0.27	10.8

* Estimate

Source: Bank of England ICMS database

*For example, Hanna and Staley (1983) quoted "reallowances" of 1-1.5% against average commissions of 1.95%, making a net commission of 0.45-0.95%.

[†]The advent of swaps may also have led to reduced commissions.

40 Margins or spreads, for example over domestic government bonds, are typically influenced by a wide variety of factors, including default risk of the issuer, call risk that bonds may be liquidated early, tax exemption, maturity, and expected market liquidity. Given these factors, in particular the fact that default premia tend to vary over the trade cycle, it is not a trivial task to isolate factors related to competition in the new issue market. Clearly, spreads can only be compared in one currency sector. However, it may be indicative of increased competition that in the case of dollar issues for supranationals the average margin in 1980-83 was 17 basis points while in 1984-87 it was -11 basis points.

41 Results drawn from grey market activity and from spreads and commissions have indicated an increasingly competitive market, relatively independent of changes in concentration. However, the end-result of the degree of competition in a market can only be observed in profitability. Various complications arise, notably the fact that eurobond activities are typically only one business entered into by a conglomerate, the results of which may be hidden in its balance sheet (though, given the importance of joint demand for fixed-income business in general, total profits on the balance sheet may reflect the underlying profitability of eurobonds). Losses on eurobond activities may be cross-subsidised by profits from other markets.

42 Given these caveats, the current state of the euromarket, with declarations from all sides of low profitability and a rapid shakeout in the market, does suggest that current profitability is low. For example, the Economist (1987) noted* that "banks lose money in the eurobond market because it is the most competitive capital market...compete to underwrite bonds at rates so cheap they can only be sold at a loss, often exceeding fees (1 7/8%)...some institutions subsidise borrowers by providing money at below market rates...In 1985 UBS, in 1986 the Japanese". These tendencies are at most tangentially in line with changes in concentration, suggesting a need to look elsewhere for causal factors[†].

43 Comparison of profitability in eurobonds with other industries is, again, fraught with difficulty. Risks, the cyclical pattern of profitability and

* It also reported that a leading firm made only \$15 mn from eurobond issues in 1986. (Although it made \$25 mn from swaps and \$60 mn from euro-equity and equity-linked bonds.) Meanwhile, another made \$86 mn on international primary capital markets in 1986, of which equity business earned 40%, eurobonds and related swaps 30%, other swaps 30%. Secondary market trading made three times as much as primary trading of which 40% was from bonds.

† The result of a weak relation between profitability and concentration has also been found in studies of the US banking market such as Smirlock (1985).

accounting differences may all blur comparisons. However, the fact that five leading US investment banks had post tax returns on average equity (a broadly similar measure) of 26% in 1982 does suggest high profitability*. This high profitability would seem to suggest low competitiveness, high concentration and high entry barriers. It is contrary to the implication normally drawn from the estimates shown above, suggesting a high elasticity of demand for eurobond issue services. However, the decline in profitability since then, when concentration has changed little and output has grown strongly, contradicts these suggestions of low competitiveness.

44 The table below shows trends in profitability of US investment banks active in the eurobond market. Profitability declined over the period shown, partly reflecting factors relating to US domestic activity although similar forces are at work in the eurobond market. As regards the US domestic market these changes in profitability are opposite to those of concentration, which rose over the period. Similarly, the decline in profits in the eurobond market has not been accompanied by a decline in concentration since 1982.

TABLE VI: PROFITABILITY OF US INVESTMENT BANKS ACTIVE IN EUROBOND MARKET
(RETURN ON AVERAGE EQUITY)

	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
First Boston	26.5%	35.1%	23.1%	18.8%	19.3%	10.4%
Merrill Lynch	22.4%	13.9%	4.8%	9.9%	13.1%	11.6%
Morgan Stanley	33.8%	27.1%	27.4%	38.4%	32.0%	25.3%
Salomon Bros	21.2%	23.5%	9.1%	20.8%	16.1%	n/a
Shearson Lehman*	n/a	27.6%	12.7%	18.9%	24.9%	n/a

Source: Salomon Bros

*Partially withdrew from eurobond market in 1987.

45 Overall, these results imply that patterns of pricing and profitability bear little relation to the structural patterns in Section III. For example, it was shown above that concentration appears high and rather stable, partly because successful entry is rather difficult, but profitability and pricing have fallen from high to low. The high estimates of the elasticity of demand cannot explain the high initial level of profitability although it is possible that the elasticity of demand may have risen, within the estimation period of the equations in Appendix 3.

*Compare the footnote on p15, which gave a range of 9.9%-16.4%.

One feature that may help explain performance is the decline in segmentation between sectors illustrated above*. But a broader examination of industry behaviour taking into account dynamic factors may be needed to explain fully both performance and the other stylised facts of the eurobond market presented in Section II.

V THE NEW INDUSTRIAL ECONOMICS AND THE EUROBOND MARKET

46 The structure-conduct-performance approach used above to analyse the behaviour of the primary eurobond market is basically a short-run static approach which takes firms as passive agents. With a given structure of single-product firms, firms are taken as maximising short-term profits. Structure is assumed to determine performance, not vice versa. This approach ignores both the effects of potential competition and the possible endogeneity of industrial structure to firms' activities**. These are addressed by recent theoretical developments, notably those regarding "contestable markets" and "strategic competition"[†]. Implicitly, these revive the importance of "conduct", often ignored in the traditional approach, and the heterogeneity of individual firms. There follows an outline of relevant aspects of these theories, which it is argued are essential to the analysis of financial markets, followed by an application of these theories to the eurobond market.

(a) Aspects of the new industrial economics

47 An area of particular interest is the role of potential entry. The threat of new entry may have a strong influence on the behaviour of existing firms, despite large capital requirements for entry. According to the theory of contestable

*In addition, although the structure-performance linkage seems weak, some aspects of the changing patterns of eurobond market structure can be explained by traditional theories of market structure. Notably, it suggests that a rapidly growing industry will be less concentrated than a stagnant industry, on the basis that there is more room for new entry [Curry and George (1983)]. This also helps explain the cyclical nature of eurobond market concentration shown in Table II.

**In fairness to the originators of the traditional view, it should be noted that they were aware of many dynamic and strategic aspects of competition. Hay and Morris (1979) suggest that the traditional approach remains relevant for stagnant markets - such as domestic banking in some countries - while dynamic theories relating to growth of the firm are applicable in growing markets, such as that for eurobonds.

[†]For a summary see Mayer (1985), also Vickers (1985) and Yarrow (1985). Porter (1980) offers a methodology for industry analysis which covers aspects of active as well as "passive" behaviour of firms. See also Parly (1987) for an application to banking.

markets[†], many seeming oligopoly situations may be characterised by competitive behaviour on the part of existing firms, because of the potential for new firms to enter in a "hit and run" manner in response to excess profits. Contestable markets may thus benefit both from efficient industrial structures and competitive behaviour. In order to induce competitive behaviour there has to be an absence of significant lags between a decision to enter and entry occurring, an instant response of demand to changing prices and an absence of losses on exit due to sunk costs (for example capital specific to the industry that cannot be used if the firm decides to withdraw). The entrant knows that if the incumbent has sunk costs, it will always be worth the incumbent's while to deter entry. According to this theory, economies of scale need not be a barrier to entry; firms can produce at minimum efficient scale for a short period and sell (storable) output over a long period. Entry into such industries is often assumed to be easier for established firms in related industries than for new firms given the frequent importance of economies of scope (joint costs); such "cross entry" is typically ignored in the more traditional approach but is obviously important in financial markets. The degree of "contestability" will of course change over time with shifts in parameters such as technology and regulation. Some have argued that contestable markets typify deregulated financial markets such as that for residential mortgages in the UK [see Davies and Davies (1984)].

48 In general, however the "contestable markets" approach may perhaps be best regarded as a benchmark or welfare standard as well as being valuable for highlighting the role of sunk costs. It seems unlikely that markets in the real world fit the assumptions, notably that there are no sunk costs (or that they are equal between entrants and incumbents) and that an entrant can come into a market and set up at full scale before existing firms respond by changing price [see Shepherd (1984)]. Where relationships and reputations are important, as in financial markets, demand will not respond instantaneously to prices. Nor are firms identical, as the theory implicitly assumes. Firms are likely to compete strategically, creating or taking advantage of asymmetries between firms, often creating sunk costs in order to deter entry.

49 A key element in a dynamic approach to industrial analysis is recognition of the discretion of firms, particularly in the case of multiproduct firms in situations of

[†] See Baumol (1982) and the review in Spence (1983).

oligopoly⁴. Discretion arises particularly from the divorce of ownership from control in joint stock companies and from excess profitability in oligopoly situations, which enable managers to change the objectives of firm behaviour and/or cross subsidise unprofitable activities. It is limited by the possibility that the share price of a firm that is not profit maximising will decline, the firm be taken over and the managers sacked. In the financial sector deregulation has permitted more "discretion" to firms to merge and to enter new markets.

50 Given discretion, firms can deviate from short-term profit maximisation, in order to influence the ease of entry of other firms and thus industrial structure, to establish their own dominance in their market or to enter new markets. Rivalry between firms is likely to be an important feature of industry behaviour. In such a dynamic approach, industrial structure is the environment in which firms pursue their objectives, but this structure can be altered by firms to their own advantage. It has typically been assumed in managerial theories that, given discretion, managers will aim to maximise sales revenue growth rather than profit maximise*. The focus in the "new industrial economics" is rather different from the managerial theory of the firm literature in that discretion is used for strategic purposes (where a "strategic move" is one designed to induce another player to make a choice more favourable to the strategic mover than would otherwise occur).

51 Applying the theory of strategic competition to entry deterrence, the traditional theory of industrial structure ("limit pricing") suggested that price or output levels of the incumbent could discourage entry, whereby existing firms sell at a price level just below that at which an entrant can obtain adequate profits. This may be unrealistic, as the incumbent firm may reduce its output in the event of entry. Instead, in order to deter entry the incumbent(s) typically vary instruments that have a lasting and irreversible effect on cost or demand conditions - that create sunk costs. The incumbent commits himself to a course of conduct that would be detrimental to an entrant. Short-run profit maximisation is traded for the long-run benefits of avoiding entry. On the cost side there could be overcapitalisation, such that the output produced by the incumbent could have been

⁴ Managerial theories of firm behaviour were an essential background to this reassessment of the economics of industry [Berle and Means (1932) Marris (1964) Williamson (1970)].

* The substitutability of profit and growth should not be exaggerated. Profits may in any case be essential for growth, given the use of retained earnings to invest in extra capacity and - in financial markets - the need for reserves and capital adequacy.

produced more effectively with a lower level of capital, or more variable factors of production[∕]. The same may hold for research expenditure, where high levels may offer a credible threat to entry. By a further strategic move, a firm may be able to raise rival's costs, for example by setting high wage rates in the industry. Pre-emptive patenting is a fourth approach on the cost side that could be used in strategic entry deterrance; though patents tend to lack force in finance, as products are easily copied in such a way as to avoid infringing patents*. Finally, if there are intertemporal dependencies of cost - the "experience curve" whereby a firm's cost level is a declining function of its cumulative output - then even price or output choice can deter entry.

52 On the demand side, firms may act strategically by advertising, product differentiation or brand proliferation to deter entry. Again, there may be intertemporal dependencies on the demand side - a reputation built up by being first or by being "trustworthy" [Radner (1986)]. It should be emphasised that entry barriers built up over time in this way need not be due to active planning on the part of the firm but may result from historical accident due to short-run profit maximising behaviour. [Salop (1979)]**

53 This analysis can also be applied to certain important forms of trade such as the buyer-seller relationship. A static analysis suggests that the seller finds a transaction profitable if the price lies above the value of selling elsewhere, while the buyer finds trade profitable if the price lies below the alternative buying price. But there may be asymmetries of information between buyer and seller, leading either to greater profits to the most informed party or a form of market

∕ Some have suggested that this behaviour characterised UK securities firms during "Big Bang" though its lack of success of deterring entry and maintaining profitability is evident.

* An exception is Merrill Lynch's successful prosecution of Dean Witter for infringing the patent on a cash-management account.

** The analysis, which applies to cases of perfect information on existing firms' behaviour, can be extended to imperfect information, ie informational asymmetries such that the entrant is unable to predict the incumbent's responses. In such cases, limit pricing may be used to deter entry since the potential entrant is ex hypothesi uncertain about the cost level of the incumbent. An incumbent may signal with a low price to indicate efficiency, whether he actually is efficient or not. Predatory pricing in imperfect information ie selling at prices below marginal cost may be a worthwhile way of building up a reputation as a committed fighter for markets, thus deterring competition, especially if the incumbent is active in a series of markets.

failure⁺ whereby the less informed party will cease to trade for fear of making losses. Given the importance of information in finance this is likely to be relevant to the nature of trade in financial markets^ø. Second virtually all forms of trade give rise to ongoing relationships, and as in the case of competition for a market, they may lead to differences between entry or exit costs. For example, the consumer may require a continuing service from the seller, so the buyer would suffer a cost if he decided to switch suppliers, and his sunk costs are positive. If the seller could withdraw without cost to himself, he has market power and could gain excess profit by threatening termination of the contract.

(b) Application to the eurobond market

54 What insights do these theories offer for the behaviour of the eurobond market? On the face of it, the market appears to have many of the features of a contestable market. Capital costs, in terms of dealing rooms, finance for underwriting, expertise, etc may be high, but those specific to eurobonds are rather low because they can be adapted from other sectors such as corporate bonds. There are a wide variety of well-capitalised firms and investment banks ready to contemplate entry. Entry can be rapid, as can withdrawal. It is thus clear that contestable market features help to explain some of the behaviour of firms in the eurobond market*, ie that it is highly competitive, especially within the individual currency sectors, despite the market structure**.

55 It should be added that contestability may have changed over time, especially within individual currency sectors. In the 1970s eurobonds were typically placed in managed accounts, international investors had few alternatives to eurobonds, and there was high demand for bonds, all these factors suggesting ease of entry. On the other hand, except for eurodollars, most currency sectors were the preserve of few domestic institutions owing to regulatory barriers and cartels. In the 1980s

⁄ See for example Akerlof's (1970) description of the second-hand car market.

ø Indeed together with systemic risk, information asymmetry is the main argument for prudential supervision of financial markets.

* Some of the conditions noted in paragraph 47 are met.

** A stronger test for contestability will be whether firms make "normal" or "excess" profits after the current retrenchment is complete.

the increasing dominance of capital markets by institutional investors¹ and the lower demand for eurobonds has made placing of bonds more difficult, adding to entry barriers. Capital costs have risen as a result of increasing use of bought deals, and the need to set up research and secondary market trading operations (to satisfy institutional investors' liquidity requirements and to gain an investor base to complement primary activities) although capital requirements as such do not prevent a market being contestable. On the other hand, entry by intermediaries to currency sectors has become easier, with the advent of swaps and improvements in technology. On balance contestability has increased, partly explaining the decline in profitability. It is however harder to explain purely in the context of the theory of contestable markets why some firms' eurobond operations have continued to be successful while others have been unable to establish themselves, why there has been no significant decline in market concentration over time despite continual new entry, and why profitability has declined so steeply.

56 Certain features of eurobond market structure, interpreted in the light of other aspects of the new industrial economics, may help to explain these tendencies. There may be significant entry barriers to the upper echelons of the industry, resulting from intertemporal dependencies on the demand and cost side and from strategic competition. Dealing first with intertemporal dependencies, the advantages of established firms may include accumulated expertise, reputation and relationships, summarised in Section II as "franchise". Offered the same price for an issue, borrowers will choose an existing firm, given their reputation for successful launches, to avoid all the disadvantages in terms of future borrowing costs should an issue fail. Similarly, investors tend not to deal with a new house if they are doubtful about its tenacity - and skilled market staff will not join a firm even for high salaries if they are unsure that it will remain in the market.

57 Recent experience suggests that these advantages of existing firms can only be offset if there is a large savings surplus in the home country, where entrants have strong relationships with investors, where there is a desire and ability to invest in euromarket instruments and/or a lower cost of capital as is the case for Japanese firms*. These enable such entrants to charge a lower price than incumbents. Implicitly, there are two types of new entry, one with a secure customer base wishing to increase its portfolio share of eurobonds, and one assuming "speculatively" that business can be taken from other houses or that a suitable

¹See Davis (1988).

*Aliber (1984) suggested this factor also enabled Japanese banks to undercut US banks in the eurocurrency markets.

share of any incremental business can be obtained. This would explain the pre-eminence of various investment banks over the years and the inability of many new entrants to gain profitability. Implicitly, exit costs exceeded costs of entry, largely due to the sunk costs of contacts, reputation and privileged access to information on market movements^ø (on the demand side) and expertise (on the cost side) built up over time.

58 In addition, incumbent firms have actively carried out strategic moves. They have, in effect, invested in excess capacity, though whether this was deliberate or accidental is harder to judge[†]. Predatory pricing as defined above has been widely used by both incumbents and entrants to the eurobond markets**. Development of specialised expertise, for example in swaps, is a further form of strategic investment. Established firms are tending to scoop up the talent in the market which is still in second-tier houses - without which they will not survive. The introduction of "bought deals" by certain houses has led to a significant increase in capital requirements.

59 It may be suggested that competition in provision of market analysis and in research and development has also been aimed at increasing market share and discouraging entry^{*}. Strong and timely market analysis may enable a firm to retain its investor base. Such analysis by some firms obliges others to gather similar information to protect themselves, or attempt to enter the market. Such duplication is arguably a deadweight cost to society. Meanwhile the invention of

^øFeldman and Stephenson (1988) offer an interesting analysis of the relationship between size and privileged information in financial markets. They suggest that while size does enable firms to gain a better "feel" for market activity - and hence profit opportunities - there are discontinuities in information flows which create a virtually impenetrable barrier to firms trying to increase trading volumes. In the eurobond market this is often due to captive investor bases. More generally, firms which try to grow beyond minimal size in OTC securities markets are seen as "potential competitors" by large established firms rather than "privileged customers" and may actually lose access to market information (the information/market share tradeoff is "U" shaped).

[†]Excess capacity is difficult to identify in the case of financial services, but could include levels of dedicated capitalisation, dealing rooms, hired expertise and settlement staff.

**The following quotations from the Banker (1988) illustrate these tendencies to predatory pricing. "Dutch bankers complain that the Swiss firms are adopting the same policy that the Japanese did in the Eurodollar market - expansion (in euroguilders) through purchase of market share. They reckon foreign-led deals are unrealistically tightly priced". "The (Coca Cola) deal (lead managed by the Swiss) wounded German pride and spurred Deutsche Bank to bid aggressively for deals wherever there was the slightest chance of a mandate slipping abroad".

*Courtadon (1985) suggested that the bought deal and r&d competition, together with placing power, were the main barriers to successful entry. The relative importance of these will of course fluctuate. Arguably innovation was more important than placing prior to the crisis in the frn market and the equity market crash, while placing power has now come to the fore.

new financial instruments may enable an institution both to make initial gains by charging high fees and, by virtue of its developing expertise, to make longer-term excess profits. Even if high prices are not charged, an innovation may give an investment bank an advantage in gaining mandates, which may enable losses to be converted into "normal" profits. Again, the private benefits to the successful innovator are likely to exceed social benefits even if the latter are positive* because many innovations, particularly on the product development as opposed to the process/new technology side, do not offer strong benefits to investors aside from existing instruments. In some cases they may worsen the situation for market participants by reducing liquidity[∅]. The large potential private benefits to innovation lead to a high and perhaps excessive level of such innovation** - including duplication of effort to the same end, at considerable resource cost.[≠]

60 The decline in profitability can also be explained by other factors relating to the nature of trade in the eurobond market between borrowers and intermediaries. Which side bears the larger sunk costs? Borrowers may find it in their interests not to break a relationship with an investment bank, as the latter may stabilise the bond price and maintain an orderly aftermarket, ensuring a good reception of future issues. If it seeks too low a spread, its issue may fail, thus damaging its chances of making further issues. On the other hand rules of the AIBD require firms to make markets, and other firms may be ready to make markets in the relevant issue. Borrowers are increasingly sophisticated and thus have less need of information that the intermediary can offer, particularly as lead manager performance can be monitored in the grey market ie information asymmetries are becoming less important. Borrowers are increasingly ready to deal with several firms rather than merely a "house" bank. The investment bank wishes to maintain

* It is not denied that a degree of innovation may be necessary for the efficiency of financial markets.

∅ The perpetual FRN is the best example - not only did it prove illiquid (a failed product) but it also helped to reduce liquidity (by externality) in the dated FRN market.

** Examination of the innovations described in Mason (1986) illustrate the number of at most marginal products that have been put on the market, all at considerable resource cost in terms of research ("rocket scientists"), product development, legal advice, advertising and other marketing expenditure. These include reverse FRNs, minimax FRNs, step down FRNs, step up FRNs, floating then zero FRNs, double drop lock bonds, multiplier "bunny" bonds, capped forex linked "purgatory and hell" bonds, marginal reverse forex linked bonds, window warrants, wedding warrants, duet bonds and serial sinking fund bonds to name but a few. The collapse of the FRN market itself spawned a vast and fruitless r&d effort to find ways to revive it.

≠ A further account of this argument is given in Appendix 5.

relationships in order to ensure future business[‡], to preserve its reputation, and to maintain the value of any information it has gathered about the firm in question - which is obviously unsaleable. Once these factors are taken into account, together with the tendencies to rapid new entry, intense competition and the high elasticity of demand for eurobonds, it is evident that the balance of advantage is increasingly to the borrower. The investment bank is unlikely to be able to squeeze monopoly rent from a relationship[‡]. Similarly, the investor base of the market has tended to change from private account holders to institutional investors. They have considerable countervailing power against intermediaries, as placing power is an essential part of dealers' strength to win mandates and again institutional investors' sophistication entails symmetric information. It is more in the investment banks' interest to maintain relationships.

VI INDUSTRY DYNAMICS

61 The theories discussed above, together with certain other aspects of industrial economics, can be used to interpret aspects of the changing patterns of eurobond market structure over time. They provide an explanation for the massive new entry to the eurobond market in recent years, which has depressed profitability* despite its relatively minor effect on concentration. While industrial markets often attract new entry when demand increases, profitability is not usually driven so low, and there is not generally such a clear asymmetry between firms.

62 Such an interpretation must attempt to explain why most new entrants have been relatively unsuccessful in establishing themselves in the market, and why they eschewed the opportunity to become "niche players", but have been unable to become major players and thereby "enter" the high-volume sector of the eurobond market. One explanation for this syndrome can be based on the various advantages to established firms outlined above**.

‡ Indeed, as noted above, eurobond business is often run on a loss-leading basis. Evidence presented in Levich (1985) showing a considerable degree of switching of lead management affiliations and aggressive bidding for new business by underwriters, supports this hypothesis. For a sample of 107 issuers having made three or more issues, 75% had used two or more lead managers. Courtadon (1985) suggested this was an increasingly important phenomenon.

* Barclay (1978), pointing to various instances of mass new entry drawing down margins has suggested that financial markets exhibit cobweb behaviour, i.e. alternating excess supply and demand which arises from time lags and irreversibility of fixed investment decisions.

** Such an explanation has ambiguous implications for a contestable markets view of eurobonds. Although effective barriers to growth tell against the "contestable markets" argument, the low resulting level of profitability support a contestable markets view.

It can also be argued that new entrants suffered from inefficiencies following their rapid growth, notably as a result of management^Ø and computer problems. Such problems would hinder their competitiveness. Other explanations are derived from analysis of the motivations of firms to enter the market.

63 Why did the firms enter the market? One reason may be that they had incorrect expectations of the growth of the market. Demand forecasts in individual financial markets are particularly uncertain, given the weak attachment of consumers, ie borrowers and investors, to the characteristics of individual asset and liability instruments. (Financial market instruments serve more as a means of transferring purchasing power than for any end-use.) For example, a wholesale switch by a corporate sector from domestic to euro credit entails a demand shift rarely seen in goods markets, especially since changes in tax, currency or interest rate configurations could later lead to a wholesale reversal of this shift. Second, the conjectural nature of forecasts of demand for financial services results from the importance of expectations. Even more than for fixed capital, demand for financial instruments varies strongly with market sentiment rather than objective facts.

64 Third, many commentators have suggested that the primary and secondary eurobond markets (and other securities markets) over the past few years have been characterised by a situation whereby the supply of bonds has created its own demand without reductions in prices, for which it is hard to find a parallel in goods markets. This has resulted from the build up of stocks of bonds by new entrants to trade and hold on own-account. There has also been an increasing tendency, given falling interest rates, of existing houses to hold bonds on own account as well as trading account, and of the purchase of bonds by houses for repackaging purposes. Such a process would, of course, be enhanced to the extent that investors mistook any price gains resulting from inventory buildups for "fundamental" gains due to economic factors and themselves increased their purchases of bonds as a consequence*. Such a syndrome** may have to unrealistic expectations of the

^ØMarrying the corporate cultures of banking and securities trading has proved particularly difficult for many firms. Longer-term problems of new "universal banks" are discussed in Rohlwink (1987).

* Assume there were 50 "entrants" with an average capitalisation of eurobond operations equal to \$50 mn. All of this is either held for trading or own account. There are 100 "incumbents" with an average capitalisation of \$90 mn, and they add \$50 mn each to their own account holdings. Together these give increases in demand for eurobonds equal to \$7.5 bn, a quite sizeable figure in relation to issuance (\$176 bn in 1987).

**Implicitly a form of Ponzi finance similar to that of bank lending to ldc's up to 1982 [Minsky (1977) presented a framework for analysis of Ponzi finance].

level and stability of demand for eurobonds by entrants, particularly since an ending of the "false liquidity" for investors that the situation entailed would be likely to make the instrument discontinuously less attractive to issuers.

65 As an alternative to false expectations of growth, firms may not have correctly estimated their ability to take business from other firms, ie they did not realise the scale of entry barriers based on historical development etc. As illustrated above, existing firms often priced strategically following entry, allowing prices to fall in order to allow entry only at zero profits, aiming to benefit from higher prices after a shakeout. This suggests that entrants were not correctly informed as to the reaction of existing firms. They may also have had a false perception of league table position in relation to profitability, a relationship that no longer holds in most markets, partly because in order to gain a high position a firm must participate in many unprofitable deals.

66 All of these arguments assume firms are short-term profit maximisers. A more likely explanation is perhaps that new entrants, aware of the limit on the number of firms that could exist in a market[†], were aiming at growth maximisation. They felt that they "had" to enter the eurobond market and gain a sizeable market share, in order to maintain profitable relationships with clients, attract new clients both to eurobonds and other financial services and/or become a "global player" despite expectations of a long period of low profits**. The advantage is therefore to those - such as the Japanese - with most capital reserves. Eurobond issue has been widely viewed as a "loss leader" in such strategies, with pricing becoming market rather than cost or profit-determined. Firms would feel they were acting strategically on the assumption that others would be the first to drop out. However, following the analysis above, markets are difficult to penetrate and profits low or negative so the "financial supermarket" strategies were misconceived*. As well as feeling that entry to new markets was the best way to maintain and develop client relationships (joint demand) managers also felt that eurobond activity generated "synergy" within the institution, for example shared r&d for international and domestic securities markets (joint costs). Again, the evidence for these synergies is weak.

[†]This feature, common also to UK gilts and equities after the "Big Bang" distinguishes mass entry to securities from the ldc debt crisis, where much of the evidence on the poor financial condition of borrowers was not available.

**Gardener (1987) noted a similar tendency in the euronote market.

*It is of interest that the strategy of some firms has now changed to "global niche marketing" ie concentrating on the sectors where their main strengths lie [Economist (1988)].

67 There may be parallels with "merger waves" in oligopolies when similar herding behaviour takes place. The top firm may merge with a second-tier firm, after which others also feel constrained to merge as a defensive move so as not to miss an "unique opportunity". In game theoretic terms, the pay-off from not merging (or entering the eurobond market) is felt to be lower than that from merging given the prior move by other firms, although the firm's preferred situation would be to maintain the status quo. As a one-off or unique opportunity, such games are generally distinct from those relating to price or output choices where there may be a co-operative solution, because sales are a "repeated game" - collusion can be sustained by threats of retaliation against non-co-operative behaviour[∅].

68 One reason why firms could persist in this loss making behaviour is the relative weakness of the takeover sanction in finance, particularly for large universal banks, though recent hostile takeover bids in the US may herald a change in this. Large commercial banks in some countries may also take excessive risks due to a perception that the authorities will not let them fail. Not that shareholders are powerless - the assumption that managers are responsible for such behaviour is not necessarily correct. Shareholder pressure to perform in line with other institutions by "going global"*[∞], analogous to trustee pressure on fund managers in equity markets, could also be a cause.

69 Whatever the underlying motivation, in practice firms were following the "herd" mentality so often observable in financial markets[∞] which due to the link between competition and risk, and the prevalence of externalities, can have serious consequences. In a similar vein, Revell (1987a) notes the effects of "euphoria" in an upswing of a financial cycle that leads financial institutions to make inadequate provision for risks and speculate excessively. A corollary of rapid entry and excess capacity should be noted - capital is probably not being used in an optimal fashion given its alternative uses in the economy.

∅ Though threats to enter each others' markets could introduce features of a repeated game to entry choice.

* An "agent-principal" problem instead of the more commonly discussed "principal-agent".

∞ Another example was the tendency of international banks prior to 1982 to lend too much to ldc's and charge mark ups for cross border risks which were ex post too low [Guttentag and Herring (1983)]. Evidence on "herding" during this episode is given in Jain and Gupta (1988).

VII CONCLUSION: IMPLICATIONS FOR OTHER FINANCIAL MARKETS AND POLICY

70 The analysis presented above suggests a number of factors which may enhance understanding of financial markets in general as well as the primary eurobond market, in particular many of the US and UK securities markets which now closely resemble the eurobond market. In most other cases the differences between markets (outlined in Table 1) have to be borne in mind in making inferences. First, traditional measures of industrial concentration appear to have relatively little predictive power regarding the behaviour of firms in financial markets, as the high competitiveness of the eurobond market attests. Two contrasting cases can be outlined. Some financial markets share the features of "contestable market" discussed above, ie entry is unrestricted for entrants in the right conditions. An additional factor is often a high elasticity of demand for financial services. In other cases, however, regulation of entry, cartelisation with appropriate sanctions to enforce oligopolistic behaviour or a low elasticity of demand for financial services are likely to lead to lower levels of competitiveness. In each case concentration can be high or low, and profitability may be high or low.

71 The contrast between the UK and certain continental banking systems offers an example. The UK system is concentrated but competitive, partly due to the ease of entry by well capitalised foreign banks, particularly in the wholesale sector, and also because of the balance of size in the "big four" - there is no dominant firm. On the other hand, entry to some other systems is restricted by law, while cartels such as those in certain European countries can offer sanctions such as non-co-operation against any entrant threatening to undercut margins. The position of cartels is strengthened if retail consumers of financial services are unwilling to use securities markets, thus strengthening the bargaining power of intermediaries vis-à-vis end users of financial services. In these cases competition will be low, again regardless of concentration (though cartels can be easier to maintain with few large dominant firms). Competition may be restricted to non-price elements or increases in the scale of operations*. The message for policy makers is that measures to stimulate competition in financial markets by reducing concentration alone are neither necessary nor sufficient to attain their objective. Deregulation and action against collusive practices are more appropriate.

*As pointed out by Smith (1978), this may be the only way to maximise profits when prices are fixed.

72 Second, financial markets may tend to experience rapid new entry in response to deregulation** or (if unregulated) to changes in demand conditions. The UK securities markets are examples of the former, while syndicated credits in the period up to 1982 as well as the eurobond market typify the latter. This is standard industrial behaviour, explicable in terms of "strategic moves", but the paradox is that new entry tends to be excessive in terms of profitability of the whole sector, and that the main sufferers tend to be new entrants, who are seeking a share of business from established houses without inbuilt advantages such as a low cost of capital or privileged access to an investor base.

73 Although capital requirements have been tightened in recent years, the entry barriers to financial markets are still not, in general, based as much on capital needs (the minimum efficient scale) as are those in industrial markets[†]. Capital needs are not trivial, but there have typically been many diversified firms with sufficient reserves to enter markets. Instead, financial markets reveal the importance of advantages based on evolution such as expertise, reputation, contacts and placing power as well as the effects of strategic competition. Entrants can succeed if they have privileged access to funds, as successive waves of nationalities dominating the eurobond market have shown. In addition, aspects of strategic competition such as predatory pricing and research are relevant. Strategic competition requires considerable adaptation of anti-trust policies [Mayer (1985)] such as public monitoring to control abuses, with the threat of fines. The implication of the importance of intertemporal dependencies, for competition policy, particularly in the special circumstances of ldc financial markets, is that breaking down entry barriers to markets may require policy makers to adopt measures such as subsidies to entrants* [see Dasgupta and Stiglitz (1985).] Obviously, such measures are less applicable in "developed" countries.

74 Rapid entry is a common feature of financial markets. Various reasons were suggested for such rapid and often unsuccessful entry, notably the generally "one-off" or "non-repeatable" nature of entry[∅], the difficulty of forecasting demand in financial markets and the desire to maintain "relationships" even though short to medium-term losses may be made in the relevant sector. Another reason for

** Deregulation itself may distort expectations of demand.

† As evidenced by the wide size distribution of successful firms.

∅ This is perhaps particularly so in the case of markets like the UK stock market, where deregulation of rights of establishment created "lumpy" changes in the number of firms.

such speculative entry may be the weakness of the takeover sanction, which would otherwise inhibit risky diversification because managers of firms making losses as a result of such moves would risk being taken over and sacked. This is clearly one argument in favour of a relaxation of the protection of financial institutions from takeover, though supervisory policy could in principle serve the same function, of inhibiting managers from mass entry to sectors.

75 Whether such rapid entry is a serious matter depends largely on the risks to financial institutions and the externalities to which such risks give rise. The discussion of competition in the eurobond market suggested that given the acute and short-term nature of risks in securities trading, increased competition tends to entail sharply increased risks. The importance of risk management as a function of financial intermediaries means this point can be applied to financial institutions more generally. The bought deal and low risk premia on bank loans are examples. The externalities resulting from failure of intermediaries* provide the basis for supervision. In addition however, they suggest that supervisors should focus on the dynamics of industrial structure as well as the risk of individual institutions, and that increased competition should be assumed to lead to increased risk cet par. The increased risk related to competition must be balanced against the benefits of pricing and capital allocation efficiency. Not that risk is the only public policy consideration here. It may be considered that long-run excess capacity entails a waste of fixed capital** (and labour) compared with its alternative uses. To the extent that this results from an inequality between private and social benefits to financial market operations, it could be resolved by a form of transactions tax [Tobin (1984)].

76 Liberalisation and the increased sophistication of borrowers and investors raises the elasticity of demand for a financial instrument. Additionally, the elasticity of demand for a particular financial instrument will tend to rise with deregulation, as the market becomes more integrated. Thus a policy of deregulation will tend to increase competition and reduce any excess profitability, subject to the various conditions on industrial structure noted above. Financial markets, particularly in securities, have a tendency at least temporarily to create their own demand for a product, as in the case of new entry to the eurobond market. Such a feature can contribute to market instability, particularly if demand suddenly falls, resulting in possible losses as well as potential risks for the system as a whole.

* For example, interest rate tiering following a shock, and the tendency of runs on banks to be contagious.

** Financial capital is more ambiguous - if firms hold their funds on deposit or in the form of securities it is not "wasted" in the same way.

77 The nature of demand in financial markets for an individual institution is linked to the relationships between buyers and sellers. Continuing relationships in financial markets have other implications besides those of barriers to entry. Relationships between intermediaries and final suppliers and users of funds can also be important in determining the degree of profitability of the industry or, conversely, the efficient allocation of funds. The preceding analysis suggested that the advantage in the eurobond market is increasingly to end-investors and borrowers. This is perhaps normal in deregulated financial markets, such as international banking and wholesale domestic banking, where counterparties are large in relation to intermediaries. The intermediaries' desire to maintain relationships will generally be stronger than users' need to maintain relationships after a deal has been made, partly because of symmetric information[✓] (ie the intermediary does not have an information advantage over the end-user). By contrast, this may not be so in domestic retail banking and securities markets; customers may need to maintain relationships in order to continue transacting, more than the institution would suffer from the loss of a (minor) relationship. This is partly a question of information asymmetries and it may help explain the relatively lower competitiveness of retail markets and the high level of expenditure on advertising in retail markets.

78 The eurobond market illustrates the way market analysis and product innovation in financial markets may tend to be excessive, according with the general critique of research expenditure offered by the new industrial economics. Firms in aggregate will invest in research beyond a level offering social benefits equal to costs because of the much higher private benefits offered by (temporarily) obtaining a monopoly. Strong market analysis enables firms to retain an investor base, and encourages other firms to duplicate such research. Once a firm has developed a reputation for such analysis, ties with investors may be hard to break. Similarly, on the product innovation side, the importance of experience-related barriers such as reputation with the new product makes the private benefits of innovation high in financial markets despite the lack of patent protection. The duplication of research and proliferation of innovations, some of which may be of doubtful economic benefit, often merely to circumvent regulations, is evidence for this suggestion. Such innovation may have an additional cost in terms of externalities, in that a proliferation of non-standard instruments may lead to illiquidity in the market as a whole*. The appropriate policy responses to these tendencies might be to encourage

✓ The continuance of corporate "relationship" banking in Germany and Japan is an important exception.

* See the discussion in Appendix 5.

collaborative r&d, or institute an evaluation process, though it could also be argued that "regulatory-arbitrage" innovations could be reduced by deregulation, or greater uniformity of regulations between countries.

79 To conclude with a look into the future, the theories outlined in this paper are of relevance to the coming liberalisation of European financial markets in 1992 [see Cecchini (1988)]. An unsophisticated view of the likely consequences of liberalisation, based on the structure-conduct-performance relation, would suggest that new entry to markets, and the reduction in segmentation on the demand side, would lead to lower concentration, increased competition and lower prices. A view based on contestable markets would suggest that these benefits could arise even without actual entry, so long as the threat of potential entry were present. While not denying these likely consequences, grounds for caution are suggested by the theory of strategic competition together with other considerations relating to the nature of the product of financial intermediation.

80 First, barriers to entry to certain markets may be stronger than they appear, due to incumbent firms' previous activities resulting in "sunk costs" such as the building of reputations and relationships as well as product differentiation and advertising. These aspects are more relevant in retail banking and in countries with "relationship" banking than in wholesale markets such as those for eurobonds. Such barriers may be aggravated by strategic moves by existing firms to counter the threat of entry, such as overcapitalisation, threats of non-co-operation and predatory pricing. If successful, such activities will enable firms to continue to enjoy the benefits of a domestic oligopoly situation. Even if incumbents fail to prevent entry, other problems may arise for the authorities. It has been shown that once entry to a newly-deregulated market begins, it can become an avalanche. This may result in excess capacity which, particularly in national markets where existing firms are small and poorly capitalised, may lead to insolvency and potential systemic risk. Those entrants who benefit in the long run may be those with significant advantages such as cheap capital. Others may be successfully beaten off by incumbents.

Appendix 1: Summary of 1983 concentration ratios in banking

Percentages of total assets of category

Country	Coverage	Commercial banks			All banking institutions		
		3	5	10	3	5	10
Unconsolidated							
Germany	A	43.0	60.7	69.4	16.6	24.0	38.2
Italy	A	28.0	40.8	61.3	17.5	25.5	40.4
Spain	A+B	28.3	42.6	57.9	17.6	26.3	35.7
Japan	A	22.6	36.3	58.1	22.9	29.6	41.5
Australia	A	66.9	92.3	99.1	30.4	46.4	65.5
France	A+B	48.5	57.4	..	33.1	47.3	60.9
Belgium	A	51.6	75.0	97.5	35.8	52.1	67.7
Ireland	A	48.0	..	..	40.0	..	..
Switzerland	A	70.6	74.7	79.8	44.8	51.5	59.3
Sweden	A	76.4	88.8	97.4	52.0	60.4	67.5
Partly consolidated or combined							
UK	A+C	18.9	25.2	..	16.3	21.7	..
Australia	A+C	65.1	87.2	98.2	46.3	62.0	69.8
Ireland	A+B+C	76.0	..	..	66.9	..	..
Consolidated groups							
Germany	E/H	44.5	60.3	68.8	15.0	22.0	35.0
UK	H	24.4	34.0	38.8	21.3	29.7	37.1
Spain	H	38.4	59.7	77.9	23.8	37.2	58.2
Italy	E	..	..	45.4	..	..	41.3
France	H	51.8	68.7	..	35.1	53.6	70.5
Netherlands	H	69.3	83.9	89.0	58.7	72.9	81.5

Source: Revell (1987b)

Notes: (1) Belgium 1982; Spain 1985

(2) Commercial banks include foreign banks (branches and subsidiaries)

Key to coverage:

- A: parent bank domestic offices
- B: parent bank offices abroad
- C: domestic banking subsidiaries
- D: banking subsidiaries abroad
- E: consolidation of all banking subsidiaries
- H: full consolidation of all subsidiaries

Appendix 2: Average five-firm concentration ratios by broad industry category (UK)

Industry category (Order)	Number of industries	Weighted average in terms of:		
		Employment	Gross output	Net output
22 Metal manufacture	4	61.9	65.2	63.0
23 Extraction of minerals n.e.s.	2	53.5	54.4	51.4
24 Non-metallic mineral products	8	43.9	46.6	48.2
25 Chemical industry	6	42.9	47.8	44.4
26 Production of manmade fibres	1	92.4	91.2	90.3
31 Metal goods n.e.s.	5	17.5	21.7	19.3
32 Mechanical engineering	10	23.0	24.5	22.4
33 Office machinery and data processing equipment	1	49.7	67.5	68.0
34 Electrical and electronic engineering	7	51.8	53.4	54.0
35 Motor vehicles and parts	3	66.1	72.8	69.4
36 Other transport equipment	5	80.0	79.7	76.1
37 Instrument engineering	4	31.8	36.5	31.0
41/2 Food, drink and tobacco	15	52.3	56.9	58.0
43 Textile industry	9	35.4	35.4	34.4
44 Leather and leather goods	2	22.7	27.9	25.4
45 Footwear and clothing	4	17.7	19.8	20.7
46 Timber and wooden furniture	7	14.4	16.4	14.9
47 Paper and paper products, printing and publishing	3	23.1	25.0	25.1
48 Processing of rubber and plastics	2	26.5	28.2	27.2
49 Other manufacturing industries	4	25.8	24.8	26.5

Source: Calculated from Census of Production 1981

n.e.s. = not elsewhere specified

Note: weighted averages are concentration ratios weighted by employment gross output and net output respectively

Source: Sawyer (1985)

Appendix 3: Econometric estimation of the determinants of eurobond issuance

1 Estimates were made of the magnitude of the determinants of gross eurobond issuance. Following the discussion in the text it was assumed that the following variables would influence issuance (bearing in mind that the level of issuance observed results both from demand and supply influences).

- the yield on eurodollar bonds
- the yield differential with US domestic bonds* (net of withholding tax)
- the yield curve relationship in the euromarkets (eurobond yield less 3-month eurodollar rate)
- the yield differential with Swiss franc eurobonds
- the US\$ effective exchange rate
- US industrial production (as a proxy for economic activity).

2 Seasonal dummies also proved to be necessary - eurodollar issuance follows a seasonal pattern, with a marked trough in December. The data period was 1983:8 - 1988:2 (monthly) and was mainly determined by the availability of data on eurobond yields. Equations were estimated for eurodollar straights, all eurodollar bonds, all eurobonds and Swiss franc eurobonds. The specification used was in error-correction format [Hendry et al (1983)] which by specifying variables in both differences and lagged levels enables one to separate out long and short-run influences on the dependent variable. (In practice few long-run effects were found, as the implicit lagged dependent variable was near-zero, leaving only the level of the dependent variable on the left hand side - in line with the short-run and opportunistic nature of eurobond issuance.) Due to the simultaneity between the dependent variable and the current eurobond yield, the equation was estimated by instrumental variables.

3 Table 3.1 shows estimates of the equations, after a specification search from a more general equation. As noted, there are few long-run effects given the negligible size of the lagged dependent variables - a point which shows in itself the instability of demand for issuance. Very high elasticities with respect to changes in yields and differentials are apparent. In general, an increase in eurobond yields decreases eurobond issuance, while a steepening of the yield curve

* AAA corporates

leads to an increase in issuance as does a decline in the dollar/Swiss franc bond differential in the case of US dollar bonds. A widening of the euro/domestic differential leads to increased issuance - an effect likely to be feeding from the lender side of the market rather than the borrower. Meanwhile a depreciation of the dollar tends to reduce eurobond issuance, especially for dollar issues suggesting that depreciation has led to expectations of further falls and hence losses for non-dollar based investors. This effect also obtains for total eurobonds, in which case it is likely to proxy the uncertainty and adverse interest rate expectations caused by a falling dollar.

4 Less attention should probably be paid to levels than difference effects, as it seems likely that the levels are partly illustrating the long-run trends (largely upward) in eurobond issuance. On the other hand, it is economically reasonable for borrowers that issuance should be higher, the lower the eurobond yield demanded by investors. A high level of industrial output, too, is likely to entail higher real levels of bond issuance. The positive levels effect of the exchange rate, on the other hand, probably illustrates more a coincidence with the trend of eurodollar issuance, as does the level of the euro/domestic differential.

5 Seasonal variables were significant in each of the equations, generally showing a sharp decline in issuance every December. The statistics indicate a reasonable level of explanation for a difference equation. The DW does indicate a degree of autocorrelation, however.

TABLE 3.1 Eurobond issuance equations (dependent variable: difference of the log of real gross issuance) Estimation method: IV. Period: 1983/8-1988/2

	US\$ straights	US\$ eurobonds	All eurobonds
Lagged dependent	-0.93 (5.5)	-0.83 (5.0)	-0.91 (5.2)
Δ RED	-1.4 (2.2)	-	-0.59 (2.5)
Δ (RED-RDB)	0.3 (1.7)	0.25 (1.5)	-
Δ (RED-REC)	0.91 (4.4)	0.75 (4.0)	0.43 (5.4)
Δ (RED-RSF)	-	-1.2 (2.8)	n/a
Δ ln EER	12.5 (2.8)	6.1 (1.8)	3.4 (1.9)
Δ ln IP	-	-	-
RED ₋₁	-0.7 (3.8)	-0.49 (3.2)	-0.32 (4.1)
(RED-RDB) ₋₁	0.46 (2.9)	0.34 (2.6)	0.11 (2.1)
(RED-REC) ₋₁	-	-	-
(RED-RSF) ₋₁	-	-	n/a
ln EER ₋₁	8.3 (3.9)	5.8 (3.2)	2.5 (3.3)
ln IP ₋₁	17.7 (3.2)	13.6 (2.8)	5.7 (2.9)
Constant	-116.1 (3.4)	-86.0 (2.9)	-32.1 (2.7)
Seasonals	Significant	Significant	Significant
R ²	0.67	0.52	0.81
DW	2.3	2.3	2.3
se	0.50	0.43	0.19

Key: RED: yield on eurodollar straights (secondary market)
 RDB: yield on US AAA corporate bonds
 REC: 3-month eurodollar rate
 RSF: yield on Swiss Franc straights
 EER: US\$ effective exchange rate
 IP: US industrial production

Appendix 4: Comparative gross spreads in international bond markets

	<u>Total</u>	<u>Underwriting commission</u>	<u>Management fee</u>	<u>Selling concession</u>
US domestic market				
estimate 1	0.875-1.0%	0.175	0.200	0.500
estimate 2	0.75 -1.0	n/a	n/a	n/a
estimate 3	0.60 -1.5	n/a	n/a	n/a
Foreign equity and bond markets				
United Kingdom				
domestic bond market	2.5%	n/a	n/a	n/a
Germany				
Stocks	4.0%	n/a	n/a	n/a
Bonds				
Public	1.625-2.0	0.375-0.5	0-0.25	1.125-1.25
Industrial	2.5	1.00	0.25	1.25
International	1.75 -2.0	0.50 -0.75	0.25	1.00
France				
Bonds				
First category	1.75%	0.50	0.10	1.15
Second category	3.00	0.75	0.25	2.00
Switzerland				
Bonds				
Government	1.50%	n/a	n/a	n/a
Foreign	3.00	n/a	n.a	n/a
Eurobond market				
Under 5 years	2.00%	0.375	0.375	1.25
5-8 years	2.25%	0.375	0.375	1.25
more than 8 years	2.50	0.500	0.500	1.50

Source: Levich (1985)

Appendix 5: Research expenditures in securities markets: a case of market failure?

1 Market failures* resulting from externalities to insolvency of institutions and conflicts of interest due to asymmetries in information are rightly seen as areas of major concern in financial markets. Their genesis and implications are noted at several points in this paper. However, it was also suggested in Section V that a further potential market failure may be present in the excessive level of research expenditures in securities markets, both in the sense of market analysis and in research and development (r&d) of new products. This suggestion, noted also in Mayer (1986) and contrary to conventional assumptions that research expenditures are generally both inadequate and beneficial, is assessed in more detail in this Appendix. It is emphasised that the suggestion is not that all research in securities markets is excessive, especially for the individual firm, nor that all of these tendencies are unique to securities markets, but that such tendencies may exist, particularly from an economy wide point of view.

2 The structure of the Appendix is as follows; first the nature of the two types of research is considered. The meaning of "excessive" is also briefly examined. The "mainstream" economic theory of research is then analysed for insights into circumstances under which such expenditures may be excessive. Finally, the "main case" for excessive research in securities markets is presented. The principal argument for both analysis and r&d relates to the focus of competition on research, and the high private gains to being first to provide information in securities markets. Additional considerations that can be adduced in the case of r&d include disappointment of expectations of liquidity in respect of new instruments, the possibility of externalities between new and existing instruments and effects on the level and asymmetry of information. The case for excessive r&d is perhaps more complex and less well established than for analysis. Therefore, much of the Appendix is devoted to development of the arguments for excessive r&d.

The nature of research in financial markets

3 Although many of the same arguments apply to both, it is important to distinguish between analysis and research and development. Analysis is exemplified by the expenditures made by financial firms when researching into security valuations, optimal portfolio compositions and their underlying determinants, ie information production. For example, firms will prepare lengthy reports on the implications of the Budget and other major developments for financial markets. In

* Defined [following Bator (1958)] as "the failure of a ... system of price/market institutions to sustain 'desirable' activities or stop 'undesirable' activities".

securities markets such as the eurobond market, the aim of such analysis is typically to maintain or increase a firm's investor base, while by contrast r&d aims to gain mandates from borrowers.

4 Turning to research and development, Hay and Morris (1979) categorise r&d expenditures as aiming for either process innovation or product innovation. In the case of finance, process innovation includes new technology for transactions, settlement or information processing. This is not the main focus here: although it can be argued that the speed of transmission of information may increase the instability of markets, in general process innovation is likely to lead to Pareto-improvements in the efficiency of financial intermediation.

5 Product innovation in finance may include both "filling the gaps" between existing products and (more rarely) creation of new products which extend the possibilities of financial instruments. An example of the former, analysed in Desai and Low (1985), using a Lancaster (1971) characteristics approach, is the progressive introduction of new savings accounts by UK retail financial institutions. The gaps in the tradeoff between return and liquidity were progressively filled over 1982-84. Of course, in extending such an analysis to securities markets risk is likely to be a third important characteristic. Features similar to the above example are present in much of the development of "unbundled" or "rebundled" financial instruments in securities markets. Creation of new characteristics space in finance is rare, but arguably some of the developments in options and futures markets qualify. Implicitly, they have helped to increase the coverage of Arrow-Debreu contingent markets, though the absence of such contracts as long-term futures mean the markets remain incomplete.

6 As pointed out by Dasgupta and Stiglitz (1980b) an important point that arises for all r&d, but especially that aimed at product differentiation, is that imperfect competition is a necessary condition for any such expenditures to be made, otherwise no profits in return for such expenditures could be earned (though the conditions of imperfect competition may be created by a patent system in an otherwise perfectly competitive market).

7 It is evident from the above discussion that it is difficult to separate research, product differentiation and fundamental innovation in finance*. Obviously these difficulties arise from the nature of "r&d for product innovation" and have been widely noted elsewhere. We take this as justification for drawing on a wider literature than that for pure r&d - which in any case concentrates largely on process innovation - though the conceptual difficulties need to be borne in mind.

* There are also parallels with the theory of investment.

How can research be excessive?

8 Research may be judged excessive for two main reasons. First there may be a higher return to such expenditures elsewhere within the firm; ie firms are pursuing such expenditures beyond an optimal level. Second the social return to research may be below the private return, even if the marginal conditions are satisfied for the individual firm. In some cases the social return may even be negative, in which case the judgment that expenditures are excessive needs little further support.

The economic theory of research

9 The theories of welfare and industrial economies that have been put forward offer some instances in which levels of research may be judged suboptimal in product markets viewed generally. Some of these offer insights into the specific circumstances of financial markets. The arguments for insufficient and excessive research are considered in turn.

10 Arrow (1962) put forward the view, which is probably the most widely accepted, that research would generally be insufficient in a competitive equilibrium. This view is based on the public good status of knowledge, which even a patent system can only partly overcome. The inventor is unable to appropriate all the returns to research activity, so will carry out less. Since patents are difficult to enforce in finance, this argument should on the face of it apply strongly - but as will be seen countervailing arguments can be presented.

11 Dasgupta and Stiglitz (1980b) put forward a modified version of insufficiency - that circumstances may arise in which research is insufficiently risky in a competitive equilibrium. Firms are biased in favour of less risky projects as long as the interest rate is positive. This may offer some explanation why financial markets have not produced all Arrow-Debreu contingent securities such as long-term futures contracts - though obviously there are other, more intrinsic reasons.

12 Not all economic theory has suggested that research expenditures are insufficient, however. In the same paper, Dasgupta/Stiglitz deduced conditions for excessive research. First, if all firms follow the same (optimal) research strategy, all expenditures by more than one firm are wasteful, since they are merely duplication. Second, they showed that the market may spend too much on research for sufficiently long patent lives, even if research strategies are uncorrelated. The social waste arises because marginal social benefit is less than marginal private benefit - the

increased probability of winning a patent (or gaining a strong position a financial market by long-term development of expertise and reputation with a new product).

13 In a separate paper, Dasgupta and Stiglitz (1980a) showed also that in competitive equilibrium there may be excessive duplication of research in the sense that industry-wide research expenditures exceeds the socially optimal level, though cost reduction is lower. The argument - analogous to those for "waste" in monopolistic competition - shows that this argument applies when industry output, and hence total r&d, increases with the number of firms, while an increase in the number of firms induces each firm to spend less on r&d, so the unit cost of production in equilibrium is higher. This combination is likely to arise when demand for the product is inelastic - not the case in securities markets, at least in recent years.

14 Industrial economics offers certain other insights into the potential for excessive research. The principal-agent literature [Jensen (1986)] suggests that resources arising from retentions are more likely to be wasted than from debt finance, due to lack of monitoring by shareholders compared with creditors. Research is often so financed, given the difficulty of obtaining debt finance for such projects, and the frequently-observed correlation of high r&d with monopoly [Schumpeter (1947), Dasgupta and Stiglitz op cit]. Although not monopolists, financial conglomerates often have resources available from positions of market power in certain markets to cross subsidise research elsewhere. Any remaining protected positions, and associated administered prices in financial markets[†] will also allow such excessive research to be financed.

15 The literature on optimal product differentiation is of relevance to research aimed at product innovation, to the extent that this is aimed at increasing the range of existing products to suit consumer's tastes (filling gaps in characteristics space). This has been explored, using various techniques, by Lancaster (1979), Dixit & Stiglitz (1977) and Hart (1983, 1985). The basic point is similar; if constant returns to scale hold, then it is optimal to produce as many goods as there are different tastes. With scale economies there is a trade-off of quantity versus diversity. Resources can be saved producing fewer goods and larger quantities of each. There will be an optimal variety, depending on the assumptions and parameters adopted. The application of this theory to finance may be less tenable - there are arguably few economies of scale in finance. In addition, the relevance of "tastes" for what is essentially an intermediate good (transferring purchasing power) is open

[†]Such as the UK securities markets prior to Big Bang.

to doubt. However, it is argued below that there may be a (small) optimal number of financial products, for reasons such as liquidity, externality and adequacy of information.

16 All the above arguments assume equilibrium in an industry. In disequilibrium states*, it has been shown in the main paper that multiproduct firms may engage in strategic competition to prevent or force entry or further their own position in an industry. These strategies may include high levels of analysis and r&d. Such strategies are not aimed at short-run profit maximising and thus arguably violate the marginal conditions for optimal resource allocation. This may be even more so if other firms feel forced to respond to an initial strategic move by increasing their own expenditures. Recent behaviour in securities markets, with all the leading firms competing to produce timely analysis and invent new instruments, typifies these tendencies.

17 This discussion of economic theory above offers some insights into the circumstances in which research may be excessive, some of which are clearly relevant to financial markets, notably duplication of research effort, cross subsidisation and strategic competition. However, the case may be strengthened by reference to some of the unique features of financial markets. Some of these points extend the theoretical insights above, others offer additional considerations. Analysis and r&d expenditures are considered in turn.

Are expenditures on analysis in finance excessive?

18 There may be a much higher private gain to analysis in finance than there is social. (In technical terms, there is an externality which drives private gain in excess of social benefit, deriving from the failure of a firm to take into account that its gain is another firm's loss.) As noted by Brealey (1985), although some such analysis has public good features - such as that carried out to forecast future cash flows and in the light of these forecasts modify future consumption plans - other analysis is more predatory. There may be "races" - entailing duplication of effort - to produce analysis of a Budget or similar financial event first. Despite the fact that social gains to receiving such reports earlier than would otherwise be the case are plausibly rather low, private gains of obtaining business following the production of such reports may be high. Similarly, firms may aim to uncover misvalued

* Which the "new industrial economics" suggests may be extremely common.

securities with the intention of realising private gains either by attracting investors or trading themselves. The importance of such analysis in obtaining and keeping an investor base, which in turn is vital to obtaining mandates, was emphasised in the main text. Particularly under condition of intense competition, such activity by some firms obliges others to gather information to protect themselves. This will be even more the case in disequilibrium states characterised by strategic competition as outlined above. The duplication of effort in production of such information is arguably a deadweight loss, which increases the costs of intermediation.

19 The argument may be extended to the whole financial sector [Tobin (1984)] if skilled labour used in research in finance as a whole is seen as less socially productive than in alternative uses in the economy. This may be particularly the case [Mayer (1986)] if there are entry restrictions to professions, such as accountants and engineers, potential entrants to which are attracted to finance. Even within finance, transfers to research-based activities away from intermediation may have similar costs.

20 There are counterarguments to the case for excessive analysis. Information is vital to the efficient operation of financial markets, and the optimal allocation of funds. In order for expenditures to be judged excessive, it therefore has to be the case that social losses due to duplication exceed social gains due to the efficiency of markets. Second, analysis partly serves the function of advertising and marketing thus attracting new investors as well as constituting a service to existing investors. If analysis substitutes for such expenditures, a higher level may be optimal than would otherwise be the case.

Are r&d expenditures in finance excessive?

21 The case given above for excessive expenditures on analysis can also be applied to r&d. For example, skilled labour used in product development may be less socially productive than elsewhere in the economy. Again this is because, following the argument in paragraph 18, r&d expenditures aim to invent new instruments with the objective of realising private gains (obtaining mandates). Such activity by some firms obliges others to invent new instruments to protect themselves (ie there are elements of a "race"). Such activity is arguably a deadweight cost which increases the price of financial services.

22 The analysis in the main paper suggests that private gains to invention of new instruments may be high and durable in finance because expertise and "reputation"* may be developed by being first with an instrument**. These intertemporal dependencies of cost and demand should enable monopoly profits to be gained for a lengthy period (Drexels and junk bonds are one example). They also reinforce the case for excessive duplication of research, given that belief in such interdependencies will lead firms to feel that high r&d expenditures are necessary to gain mandates.∅

23 Other arguments, which suggest that the social return to r&d may be negative, can also be adduced. New instruments often prove illiquid - often due to small amounts outstanding. Although there may be high private returns to their inventors, those buying the instrument with expectations of liquidity suffer welfare losses when they are disappointed. The proliferation of new instruments may have other deleterious effects. It may be the case that the replacement or supplementing of one basic instrument with a range of differing instruments reduces total liquidity. Where this is the case, there is a welfare loss to an investor who seeks a liquid instrument in the relevant part of characteristics space and no longer finds one, (although others, looking for instruments in the gaps in characteristics space, may be satisfied, and there may be improved opportunities for risk diversification). This syndrome may have occurred for certain euromarket instruments⁺.

24 One can go further and argue that there may be strong externalities to the introduction of new instruments close to existing ones in characteristics space. If the market for the new instrument collapses - the classic case being the perpetual FRN market - the existing instrument may also become moribund - the dated FRN. This occurred although the problem with the perpetual FRN - which some have suggested

* Of course reputation also has important benefits in financial markets - it may direct business to firms which engage in good practices, and vice versa for bad performers [Radner (1986)].

** Necessary conditions for such a strategy to be successful are that customers should be attracted to the firm by new products and that the loyalty of customers should be retained once they use the products of the firm in question. This would not be the case if "loyalty" remained constant: if customers were always loyal they would not be attracted in the first place; if their loyalty were minimal they would drift away soon after being attracted. Instead, the hypothesis must be that product development can change the loyalty of clients - which could be plausible if the new product is nearer to their optimal point in characteristics space, and if customers believe in the importance of expertise and reputation built up over time with the new product.

∅ An alternative argument could be made in terms of the stimulus to rapid innovation from the lack of patent protection and diminishing marginal productivity of innovations ie if firms discount intertemporal dependencies. However, this would clearly entail some non-profit maximising objective for firms.

+/ By contrast on domestic markets technology, deregulation etc have been a countervailing force, increasing the liquidity of basic instruments such as government bonds and equities.

resulted partly from the fact that investors and traders had not fully understood its equity characteristics* - found no echo with dated FRNs, pricing of which as a debt instrument is straightforward. This, one can suggest, is a case of contagion as much as is contagion between failing and sound but comparable financial institutions. Such externalities to product differentiation are far less common in goods markets.

25 Financial r & d may affect levels of information. If information is rendered incomplete this may induce greater risks than would otherwise be the case. Appropriate pricing and the nature of pricing dynamics of new instruments need not be obvious even with use of computers. Losses by Merrill Lynch on CMOs (Collateralised Mortgage Obligations) are one example. Both banks and supervisors are thus obliged to devote resources to understanding new instruments. Second, new instruments may induce greater information asymmetries between intermediaries and final users, which the former can profit from, either distorting the allocation of resources, or causing the latter to withdraw from the market entirely.

26 A perhaps more subsidiary point has been advanced by Newbery and Stiglitz (1984). They showed that introduction of trade where there was previously autarky (eg by financial innovation) need not be optimal in the absence of a full set of Arrow-Debreu contingent markets. Trade can reduce the price fluctuations that stabilise producer incomes in the presence of output fluctuations and thereby discourage the production of risky products.

27 Again, countervailing arguments against excessive r&d should also be considered. Similarly to analysis, r&d for product innovation serves the function of advertising or marketing as well as its conventional use; it attracts mandates to an intermediary. To the extent that r&d is thus a substitute for such expenditures, the image may be created of excessive r&d when viewed conventionally. Second, launch costs for new products are typically lower in finance than in other industries. Third, many products may fail, thus increasing the risks and costs to offset against levels of expenditure.

* Other important causes of the perpetual FRN crisis included the impending agreement on international capital convergence, which it was feared would lead banks to sell their holdings, excess supply of bonds given the size of the investor base, and false expectations of liquidity given the narrowness of the market.

28 Finally, the argument of Arrow that r&d will generally be inadequate appears on the face of it to apply strongly to new financial instruments. Patent protection is generally weak or non-existent, as is illustrated by the rapid proliferation of new deposit instruments in recent years. Why should this not lead to inadequate innovation in securities markets? The argument is that firms believe that borrower loyalty to firms making successful innovations offers a private gain, despite lack of patent protection, which is sufficient to lead to duplication of research, particularly given market conditions characterised by excess capacity and strategic competition.

29 It is concluded, on balance, that both analysis and r&d in securities markets may frequently be excessive. This is due in particular to the focus of competition on research and the potential gains to being first with information or a new instrument. Especially given the intensity of rivalry between firms, these tendencies lead to excessive duplication of research and - in the case of r&d - to problems of illiquidity, externality, and inadequate information. Such arguments suggest that research expenditures in securities markets should be viewed cautiously by policy makers, with no presumption that all of such expenditures are beneficial.

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