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## Discussion Papers

No 50

**An industrial approach to financial instability**

by

E P Davis

*June 1990*

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**Abstract**

It is suggested that periods of financial fragility, which may culminate in financial instability, are often preceded by changes in conditions of entry by intermediaries to financial markets. Such developments may lead to heightened competition in the market concerned, whether due to actual new entry (tending to perfect competition), changes in behaviour that incumbents are obliged to adopt due to the threat of new entry, in the absence of sunk costs (heightened contestability) or competitive responses that incumbents choose to make to potential or actual entry in the presence of sunk costs (strategic competition). Especially in the absence of appropriate supervision, such heightened competition may provoke reductions in prudential standards (which may be manifested in lower capitalisation, and lower prices and higher quantities in credit markets). This in turn can lead on to financial fragility (ie a situation where a shock such as a monetary tightening can lead to widespread failure of financial institutions, with potential for systemic risk). In effect, the market may overshoot the levelof competition which is sustainable in long run competitive equilibrium, and various market failures and distortions (many of which are discussed in the existing literature on financial crisis) can be adduced to explain this. The analysis justifies various approaches to regulation (such as capital adequacy and direct controls on lending) which have recently been strengthened, as well as offering some additional indicators of potential fragility that my be of assistance to regulators and markert participants.

## I Introduction

1 Davis (1989) identified a number of features common to most periods of financial instability in recent decades, including debt accumulation, unanticipated shifts in policy or regulatory regime, financial innovation, monetary tightening, credit rationing and international transmission. These observations were felt to validate to some extent the various theories of financial crisis that have been proposed in the literature, in particular those emphasising monetary, financial-fragility, uncertainty and credit rationing aspects of crises. On the other hand, no one theory was able to explain financial instability alone; features of several had to be jointly present in order for a situation of financial instability to arise.

2 This paper explores the hypothesis that many of the factors underlying heightened financial fragility can be adequately subsumed in an industrial organisation framework, with particular reference to the role of an intensification of competition among financial intermediaries following market developments which reduce entry barriers. The approach seeks both to encompass the mechanisms highlighted by existing theories of financial crisis, and also to extend them by focussing on certain structural aspects that have hitherto been generally neglected by theorists. It is suggested that the hypothesis could provide useful leading indicators of potential situations of instability, both for regulators and for market participants themselves. Such indicators may be of particular relevance given the rapid changes occurring in many financial markets, notably in certain EC domestic markets after 1992, and in Eastern Europe as former command economies liberalise.

3 It is noted that the potential importance of the linkage from easing of entry conditions to financial instability is not unknown to practitioners, for example Broker (1989), writing for the OECD Expert Group on Banking noted that "the painful experience of some countries (following deregulation) suggests the need for safety measures to ensure the stability of the system by preventing competition... becoming destructive". But the dynamics of competition amongst intermediaries in financial markets following reduction in entry barriers is rarely assessed analytically or discussed in contexts other than deregulation (when in fact a wide variety of developments, including innovation and technical progress as well as sharp changes in demand for credit itself can lead to changes in entry conditions to financial markets).

4 The paper is organised as follows; Sections II and III assess the relevant aspects of the theories of financial crisis, and briefly introduce recent developments in the theory of industrial organisation. In Section IV, the core of the paper, a synthesis between these approaches is developed which explores the transmission mechanisms between changes in entry conditions and financial fragility. Evidence for the mechanisms highlighted in the synthesis, drawn from the various periods of financial instability of recent decades is presented in Section V, while in Section VI consideration is also given to features of periods of new entry and intense competition when instability did not develop. Section VII draws together the conclusions, suggests implications for regulatory policy and highlights the potential uses that could be made of the mechanisms outlined, as well as suggesting some areas where reductions in entry barriers may require heightened vigilance by regulators and market participants.

5 Before commencing, it is appropriate to clarify terms. "Fragility" is defined as a situation where, first, balance-sheet weakness of intermediaries or debtors leads to a negative net worth of such institutions in a wide variety of states of nature, and, second, linkages between firms imply that such weakness can potentially generalise across the wider economy. Hence realisation of such an unfavourable state can lead on to "instability" or "disorder", that is, a disturbance in financial markets which entails unanticipated changes in prices and quantities in credit or asset markets, which may disrupt the capacity of the financial system to allocate capital and lead to a potential for "systemic risk" - contagious and widespread failure of financial intermediaries. Use of the terms instability and disorder rather than crisis in the title is deliberate, and reflects the fact that recent events (outlined in Section V), though serious, did not in themselves lead to macroeconomic depressions, widespread financial collapse and dysfunction of the payments mechanism (this was either because the events were not in themselves sufficiently serious or because government intervention and regulation prevented full-blown crises from arising). In the text we use terms more loosely for the sake of brevity.

6 Finally, because of the infrequency of situations of financial instability or disorder, the evidence is of necessity indicative rather than conclusive, but more rigorous tests using econometrics are not a feasible alternative.

## II Theories of Financial Crisis

7 A comprehensive literature survey is provided in Davis (1989).[2] Here we offer a selective summary, with emphasis on the role of structural changes in patterns of intermediation in the development of crisis situations. Do changes in competitive conditions among intermediaries have a role to play?

8 The monetarist approach emphasises banking panics, that may cause monetary contraction. Banking panics arise from a public loss of confidence in banks' abilities to convert deposits into currency. This may be caused by failure of an important institution, which may in turn stem from failure of the authorities to pursue a steady and predictable monetary policy. However, the approach does not take the further step back to assess how a key bank could get into such a vulnerable condition. The underlying assumption seems to be of a relatively static financial market structure.

9 Theories emphasising debt and financial fragility consider financial crises to be a key feature of the turning point of the business cycle, a response to previous "excesses" of borrowing which can operate through a variety of financial markets. Amongst the key components of the theory are, first, the concept of a displacement - an exogenous event leading to improved opportunities for profitable investment - and, second, monetary financial innovations which partly offset increases in interest rates caused by excess demand for finance during the fixed investment boom. However, sharp increases in demand for credit mean interest rate increases eventually occur, which leads to "fragility". Features of fragility include an increase in debt finance, a shift from long to short-term debt; a shift from borrowing which is adequately covered by cashflow to borrowing not covered at all by it; a heightening of speculative activity in asset markets; and a reduction in margins of safety for financial institutions. Further rises in interest rates, perhaps due to policy tightening, lead on to financial crisis.

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2 Key references are Friedman and Schwartz (1963) (monetarist); Minsky (1982); Kindleberger (1978) (financial fragility); Shafer (1986) (uncertainty); Guttentag and Herring (1984) (credit rationing).

10 As in the monetarist view, there is little explicit consideration of market structure. Declining risk premia, for example, are held to be purely cyclical phenomena, though the involvement of structural factors in the process, eg setting up of new credit institutions during the upturn which disappear in the crisis, is not ruled out, and financial innovation is explicitly recognised as an important component. Apart from this, however, the theory is again consistent with an unchanged industrial structure of financial markets during the development of financial fragility.

11 Theories stressing uncertainty and credit rationing, which were often developed from those of financial fragility, introduce other actual or potential structural mechanisms.

12 Theories of crisis focussing on uncertainty define it as pertaining to future developments not susceptible to being reduced to objective probabilities[3] (eg financial crises) and also providing opportunities for profit in competitive markets. Responses to uncertainty, for example by lending officers in banks, may be to apply subjective probabilities to uncertain events plus a risk premium. But agents often tend to judge such probabilities by the actions of others (ie herding) which can lead to financial instability if the crowd proves to be wrong. Meanwhile super-normal profits can only be earnt by innovation when there is uneven information and uncertainty. But such innovation may lead to crisis if deteriorating balance sheets follow the innovation process or firms fail to understand the properties of innovations (perhaps due to lack of experience). Uncertainty itself may thus be raised by the innovation process. In the presence of uncertainty adverse surprises may trigger shifts in confidence, affecting markets more than appears warranted by their intrinsic significance: hence a crisis.

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3 Or alternatively and more loosely, to which expectations can only be applied with extreme difficulty.

13 In this paradigm, the process of competition is highlighted as well as the interactions between players. But there is no precise description of the links between levels of uncertainty, competition and innovation. Does heightened competition increase uncertainty (other than via innovation?). Are uncertain events largely exogenous to market processes or endogenous?

14 Paradigms of credit rationing suggest financial crises are characterised by abrupt increases in rationing, both by price (ie higher risk premia) and quantity (ie, following Stiglitz and Weiss (1981), absolute limits on borrowing resulting from information asymmetries between borrower and a (profit maximising) lender and lack of control of the borrower by the lender). Such increases may follow previous periods when rationing has been loosened to an excessive extent. The incidence of ("equilibrium") price or quantity rationing is held to depend on the borrower's capital position.

15 Extending the theories stressing uncertainty outlined above, a further distinction is made between, on the one hand, systematic market risks such as recession and on the other financial crises - the latter being subject to much greater uncertainty as outlined above. In the case of recession it is suggested that objective probabilities are known and subjective probabilities tend to the objective, because unfavourable outcomes are frequent enough to ensure an over-optimistic intermediary is driven from the market (this does however assume a suitably long time horizon). But for financial crises and other uncertain events there is no such presumption; competition may drive prudent creditors from the market as they are undercut by those disregarding the likelihood of financial crisis for reasons of ignorance or competitive advantage.

16 As well as competition, various psychological factors underlying this pattern of "disaster myopia" may be identified, notably a tendency to calculate probabilities by ease with which past occurrences are brought to mind, which declines with time, as well as institutional factors such as short periods over which loan officers are assessed, and asymmetry of outcomes for managers and shareholders. These tendencies, which imply declining subjective probabilities of shocks during periods of calm, may lead to declining capital positions, loosening of "equilibrium" price and quantity rationing of

credit, and hence increased objective vulnerability of creditors to shocks. Subjective and objective probabilities may thus during a period of calm drift further and further apart, until a shock leads to an abrupt increase in credit rationing triggering a crisis, as lenders become aware of their imprudence.

17 Again, in this paradigm there is some discussion of competitive conditions in markets. The existence of imprudent creditors, which eventually force others to emulate their short termism, is an important part of the process; but it is not specified whether they are new entrants, nor is there any discussion of the extent to which innovations and other changing demand and supply conditions may influence the process.

18 In sum, extant theories of financial crisis tend to suggest a potential importance for changing industrial structure and levels of competition, but generally do not specify them explicitly. Most of the theories are consistent with a steady-state financial system, subjective to various cyclical, monetary or other (largely exogenous) shocks. Can theories of industrial organisation help further to illuminate the nature of financial crises? We now go on to outline potentially relevant points.

## III Recent Developments in Industrial Economics and their Application to Financial Markets

19 While traditional industrial economics tends to distinguish perfectly competitive from oligopolistic markets by reference to barriers to entry such as economies of scale, the new industrial economics, as it is often termed, lays stress on the important of sunk costs as an entry barrier to markets, ie costs which cannot be recovered in exiting from the market. If there are sunk costs, entry can always in principle be deterred by incumbents. Sunk costs may develop over time (eg by reputation and expertise) or may be created by means of strategic competition (product differentiation, advertising etc). Regulations preventing entry can be conceptualised as an extreme version of such barriers. In contrast, economies of scale are not seen as an entry barrier, because in the absence of sunk costs another firm, perhaps in a related sector, can set up production and enter the market in a hit-and-run manner (the "contestable markets" paradigm). Seeming oligopolists can be disciplined by this potential competition to act in a perfectly competitive manner, while in a market without economies of scale, a decline or elimination of sunk costs may tend to a perfectly competitive market per se.

20 Davis (1988) applied these concepts to the eurobond market and suggested that they offered useful insights into market behaviour among financial intermediaries (for a summary see Appendix 1). However, what is most crucial at this stage is an understanding of these paradigms per se. For this reason, we now go on to discuss the approaches of contestable markets and strategic competition in somewhat more detail (features of standard perfect competition, which are also an important component of the argument, are taken as known). We also note the potential importance of non-profit maximising behaviour (managerial theory of the firm). Those already familiar with these theories should move on to Section IV.

21 According to the theory of contestable markets [see Baumol (1982) and the review in Spence (1983)] 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. (Obviously, if there are neither economies of scale nor sunk costs, the paradigm collapse to that of competitive equilibrium.) Entry into oligopolistic 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)].

22 Others, in contrast, have suggested that 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. They would argue that not many 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 to changing prices [see Shepherd (1984)]. Where sunk costs such as expertise, relationships and reputations[4] are important, as in most financial markets, demand will not respond instantaneously to prices. Nor are firms identical, as the theory implicitly assumes. We outline two alternative theories of firm behaviour in the presence of sunk costs.

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4 These may constitute the principal asset of the intermediary itself.

23 A key element in a dynamic approach to industrial analysis is recognition of the discretion of firms to deviate from short-run profit maximisation, particularly in the case of multiproduct firms in situations of oligopoly (such as banking and finance in many countries). As well as from sunk costs themselves, which offer excess profitability enabling currently unprofitable activities to be cross subsidised, discretion arises from the divorce of ownership from control in joint stock companies, which enables managers to change the objectives of firm behaviour. Such behaviour 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,[5] although to the extent it reduces entry barriers, it has also tended to reduce excess profitability from oligopoly.

24 It has typically been assumed in managerial theories [such as Williamson (1970)] that, given discretion, managers will aim to maximise an objective such as sales revenue growth, which enters the managerial utility function, rather than profit maximise in either short or long run. And indeed behaviour of financial institutions (seeking growth in balance sheet size or market share) suggests that this may be a common objective. [Although 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.]

25 The focus in the "new industrial economics" [see, for example, Mayer (1985), Tirole (1989)] 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) and the principal goal of managers is again assumed to be (long run) profit maximisation.

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5 And some intermediaries remain protected from takeover.

26 For example, 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 as 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 over-capitalisation, such that the output produced by the incumbent could have been produced more effectively with a low 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 deterrence; though patents tend to lack force in fiance, 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 (experience itself being a sunk cost) - then even price or output choice can deter entry.

27 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 - arising from sunk costs such as relationships and 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).] 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 cases of imperfect information ie selling at price 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.

28 In application of these concepts to the behaviour of intermediaries in the primary euro-bond market, Davis (1988) found that the market shared both contestable and non-contestable features (see Appendix 1). Of course, one aspect of financial market conditions not tested in the eurobond market is that of regulation, prevalent in domestic markets, which acts similarly to sunk costs as a barrier to entry or activity. Equally, while strategic mechanisms such as innovation and product differentiation are stressed in the discussion above as a barriers to entry, they may also act as a means of entry if a new firm, for example, uses an innovation to help it gain a clientele from other firms.

## IV An Industrial Approach to Financial Instability

29 Bringing these analyses together enables one to outline an approach to financial instability based on the industrial dynamics of competition in financial markets which both encompasses most of the features outlined in the theories of financial crisis and extends their analysis by explicit discussion of structural features. Evidence is presented below (Section V) which indicates the validity of some of the mechanisms discussed for recent periods of financial-fragility.

30 The approach is developed in detail below, but its essential features may be summarised as follows; periods of financial fragility, which may culminate in crises, are often preceded by changes in conditions for entry to financial markets. Such developments lead to heightened competition in the market concerned, whether due to actual new entry (tending to perfect competition), effects of potential new entry on the behaviour of incumbents (heightened contestability) or competitive responses of incumbents to the threat of entry (strategic competition). Especially in the absence of appropriate prudential supervision, such heightened competition may provoke reductions in prudential standards (which may be manifested in lower prices and higher quantities in credit markets as well as declining capital ratios). This in turn can lead on to financial fragility. In effect, the market may overshoot the level of competition which is sustainable in long-run competitive equilibrium, and various market failures and distortions (many of which are discussed in the existing literature on financial crisis) can be adduced to explain this.

### (a) Declining sunk costs of entry

31 The new industrial economics, as summarised in Section III, stresses the importance of irrecoverable costs as barriers to entry, which prevent achievement of competitive equilibrium (in the absence of economies of scale) or contestable markets (given economies of scale). In the presence of sunk costs, prices in equilibrium may exceed competitive levels as incumbents gain supernormal projects from their protected situation (often, but not necessarily, with the aid of collusion). In capital markets this might be manifested in high underwriting costs of new issues; in banking markets by

large spreads between deposit and loan rates. In each case credit availability might be below equilibrium levels.

32 Such an equilibrium may be disturbed by any developments which change the sunk costs of entry, and thus lead to heightened potential for such entry. In unregulated markets (such as the euromarkets) sunk costs might decline due to product innovation by entrants (which enables them to overcome barriers arising from reputation of incumbents with existing products); establishment of new markets (such as wholesale or interbank markets) which offer funds to banks lacking branch networks to collect retail deposits; technological advance, that may reduce the need to set up subsidiaries in a major centre; and market developments that devalue the advantages built up over time by incumbents (eg loss of reputation due to a debt crisis, or new types of borrower with whom they lack established relationships). Similar factors will apply in domestic markets, with one important addition, namely the possibility of deregulation. In effect, this may change "sunk" costs of entry from infinity (where regulation bars entry) to a low level at which entry becomes attractive.

**(b) Results of declining sunk costs**

33 Three alternative approaches outline the consequences of lower entry barriers, though as discussed in Section (c) below, all are likely to have similar consequences for market behaviour.

34 First, in the absence of economies of scale and of sunk costs, in the new state of the world, heightened competition is likely to arise via actual new entry, which drives prices and quantities from an imperfect towards a perfectly competitive level.

35 Alternatively, in the presence of economies of scale but lacking sunk costs of entry, potential competition will lead the incumbents to adopt prices and quantities similar to those in competitive equilibrium, ie the contestable markets paradigm will apply.

36 Third, when sunk costs are reduced but not eliminated there will again be some effect on prices and quantities, but also both entrants and incumbents are likely to engage in strategic competition, varying instruments that have a lasting effect on supply and demand conditions and which seek to change the behaviour of competitors. As in other industrial markets, this may include innovation or product differentiation so as to reduce the niches available to entrants; overcapacity, and higher factor costs. In the presence of imperfect information, price competition may also take on strategic aspects. And more generally, predatory pricing or even price wars may be used in order to seek to influence rivals' behaviour. Any prior collusive agreements are likely to be weakened or destroyed in such cases.

37 As is shown for the primary eurobond market in Appendix 1, competition in financial markets is likely to exhibit features of all three of these paradigms. On the one hand, there is likely to be new entry following declines in sunk costs, which will reduce profitability for all intermediaries. Prices of financial services are likely to fall. But there remain some economies of scale, for example those resulting from risk pooling, and hence the number of firms may be limited. Finally, some advantages for incumbents related to sunk costs (such as reputation, relationships and expertise) are likely to remain. They are likely to engage in some strategic competition to defend their positions, such as predatory pricing. Although such behaviour is not totally successful (their profitability declines) it may succeed in confining new entrants to certain segments of the market and in maintaining a distinction between leading incumbent firms, who retain large shares of the market, and new entrants whose share is relatively small.

**(c) Consequences of increased competition**

38 The effects of heightened competition are similar in each of the cases outlined above; declining profitability, lower prices and increased quantities. In financial markets, lower profits entail reduced ability to maintain capitalisation as a cushion against shocks, while lower prices and increased quantities may entail provision of loans at lower risk premia or to riskier borrowers. Such effects may be traced for both banking and securities markets.

39 At a most basic level, in a banking market where credit is rationed by price an increased availability of credit is likely to entail lower risk premia throughout the market. Given a downward sloping demand curve, borrowers who were previously inhibited from taking on any or more credit for reasons of cost may increase their borrowing as a consequence. Such a tendency may be particularly marked if new intermediaries price at below market clearing levels in order to gain initial market share in the face of the various advantages of reputation, information etc enjoyed by incumbents. But lower prices and increased quantities are also likely to arise in cases of heightened contestability (as entrants reduce prices in response to the threat of entry) and via strategic competition (such as predatory pricing by incumbents).[6] Heightened competition is also likely to lead to a shift in bargaining power from the intermediary to the borrower; the latter may be forced to accept lower profits to maintain relationships, preserve its reputation and maintain the value of information it has collected about a firm.

40 Loosening of credit rationing is also likely for borrowers who are initially in a situation characterised by quantity rationing. On the one hand, any tendency for slow adjustment of rates to market conditions (with consequent credit rationing) is likely to be eliminated. More seriously from the point of view of risk and profitability, a situation characterised by equilibrium credit rationing (resulting from asymmetric information between borrowers and lenders) is also likely to be disturbed. New entrants seeking market share or incumbents seeking to reinforce their own positions will seek to satisfy the credit demands of those who are quantity rationed, although rationing was a profit maximising strategy in the pre-entry situation. It is likely that the boundary between those who are price rationed and those qua ntity rationed will shift in favour of the former, although information on those previously rationed remains imperfect and/or their

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6 We note that the cases of contestability and strategic competition are not always easy to distinguish. Reversibility of price reductions, success in preventing entry and concomitant increases in innovation and other instruments of strategic competition may indicate the latter.

capitalisation or collateral is inadequate. Such a tendency will be particularly marked if new credit markets (eg junk bonds) become available to those previously confined to banking markets. Equilibrium quantity rationing depends on the existence of some market segmentation. Note that loosening of equilibrium quantity rationing may entail increased risk although risk premia remain the same or even increase, so long as quantities increase.

41 Competition may also have an effect on the liabilities side of balance sheets. Banks will compete more aggressively for deposits, reducing the spread between deposit and loan rates. Such competition may sharply reduce profitability if higher rates are paid on the whole stock of deposits and not merely at the margin.

42 The discussion above is set largely in terms of banking, but similar arguments apply to primary securities markets. Heightened competition is likely to lead to a reduction in underwriting margins which thus increases risk. Securities houses may take on greater risk per se so as to obtain a greater share of the fees involved in bond issuance; for example, by undertaking bought deals, where the lead manager takes the whole of a new issue onto his books, before selling it on to investors. (Bought deals may also act as a barrier to under-capitalised firms, ie their introduction may itself be a form of strategic competition.)

43 Finally, heightened competition may lead financial market participants to reduce their capitalisation. If the mean return to capital when operating in a prudent manner is reduced sharply by new entry, there may be a temptation to increase leverage, thus offering a higher mean return at a cost in terms of greater risk of bankruptcy. In many cases the intermediary will have little choice, as competition reduces profitability from which capital may be built up.

### (d) Need competition cause fragility?

44 One objection may immediately be posed to any attempted linkage between the above description of the industrial behaviour of financial markets and financial instability, namely the existence of a competitive equilibrium in which financial firms make normal profits, risks are adequately covered in loan pricing/underwriting margins and capitalisation, and although the system may be subject to shocks, these do not generate systemic crises. In such an equilibrium, risk premia would be sufficient to cover losses over the economic cycle, and borrowers for whom information or collateral were inadequate would be quantity-rationed in an equilibrium manner. It might be thought that the shift to such an equilibrium from an imperfectly competitive or oligopolistic market (where insufficient credit was advanced and intermediaries gain monopoly profits) should not be a cause for vigilance, but instead a pure welfare gain.

45 The reasons why it may not be the case, <u>especially if prudential supervision is weak or absent</u>, are basically the set of market imperfections outlined in the "uncertainty" and "credit rationing" approaches to financial crisis. Because of factors such as the importance of information and uncertainty in financial markets; any inadequate or ill-directed regulation; and certain features of newly competitive markets per se (short time horizons, competition for market share, oligopoly dynamics), financial markets for which entry barriers are sharply reduced may be prone to levels of competition which prove ex-post to be excessive. This may entail risk premia below those needed to cover losses, excessive leverage and a relaxation of prudential standards. In such conditions, banks may be particularly vulnerable to runs leading to bankruptcy. Because of externalities between financial firms such as contagion, as well as banks' key role in monitoring of loans in the presence of asymmetric information, such potential failures that arise from excessive competition are a public policy issue in

a way that they are not in other industries.[7] Although examples of their operation in other industries, such as retailing and estate agency, are common, [8] such problems are usually worked out by merger and size adjustment. There may also be some bankruptcies, but they may not involve such significant systemic risks as in the financial sector.[9]

46 We now go on to discuss these potential sources of market failure one by one, while noting that several or all of them may be simultaneously operative. It is suggested that although excessive competition cannot always be perceived ex ante, these sources do offer some potential indicators of fragility.

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7 For a discussion of these issues see Diamond and Dybvig (1983) and summaries in Miles (1988) and Goodhart (1989). In a nutshell, regulation of banks is needed because banks provide liquidity insurance to risk averse consumers facing private liquidity risks, while reflecting the preferences of borrowers, banks' assets are long term and illiquid, ie banks transform illiquid assets into short-term liquid liabilities. The risk sharing deposit contract leaves banks vulnerable to panic runs even if they are not insolvent, because banks must pay withdrawals on demand until insolvency is declared, and hence depositors who withdraw funds first minimise the risk of not being paid in full. A bank run is costly in terms of real resources as the production process is interrupted and assets are prematurely liquidated. Further, there is a danger of systemic failure due to contagious bank runs. Contagion is particularly likely in the presence of interbank lending, which affords a direct link between banks balance sheets. Widespread failure of banks may create a strong negative externality to agents in the real sector - a significant proportion of whom, due to private information held by banks and banks' unique role as monitors and evaluators of loan contracts, can only obtain credit from banks. These costs are of course additional to costs that may arise in any bankruptcy such as costs of reorganisation and any social losses from breaking up unique bundles of assets. Many of the costs of bank failure may apply to failure of investment banks as well as commercial banks.

8 Nevertheless some of the features noted above - eg problems of information, uncertainty and inadequate regulation - are particularly marked in financial markets.

9 Externalities arising from contagion and counterparty risk following bankruptcies of non-financial firms cannot be ruled out, of course, and counterparty risk may affect financial institutions if they are already vulnerable.

### (e) Reasons for overshooting

#### (i) Information

47 As noted by Chant (1987), banks may be characterised as "monitors and enforcers of loan contracts ..... managing risk is performed by acquiring non-marketable securities for which the institution takes the responsibility for screening information about the borrower. The value of these assets is specific to the institution ..... who has gained the information required .... and understands the problems with respect to enforcement. These dimensions of the customer relationship must be built up over time. The value of these claims would be less for an outside party who has not gained the knowledge embodied in the customer relationship ..". To the extent new entrants can induce borrowers to switch away from established credit relationships or offer extra credit (by offering lower prices), such information based linkages will be weakened and existing information devalued. Conceptually, new lenders may be seen as "cannibalising" existing market information and structure, to the detriment of existing firms. Despite this, however, new lenders are still likely to lend on the basis of inadequate or asymmetric information during the initial stages. Thus, for both types of lender, entry may lead to a lowering of credit standards.

#### (ii) Uncertainty

48 Uncertainty may be increased by new entry. Incumbents may be unable accurately to predict the responses of new entrants to changing conditions, and their existing knowledge of market dynamics will be rendered less useful. Entrants, inexperienced in the market, will face even greater uncertainty. Unaware of the dynamics of supply and demand in the market they may be prone to herd-like behaviour, all lending to the same type of client. When the market itself is new, all firms will face uncertainty.[10]

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10 In practice, most of the crises discussed below occurred in existing markets, though new markets often played a role in facilitating entry (eg by improving possibilities for funding).

49 More generally, the effects of uncertainty discussed in the theories of financial crisis summarised above will be heightened when the industrial structure of the market becomes fluid. For example, it was noted how competition may cause firms to make inadequate provision for uncertain events such as financial crisis, because firms making such provisions are undercut by those disregarding such possibilities for reasons of ignorance or competitive advantage. New entrants may be particularly prone to this. Sufficiently short time horizons may even make firms disregard systematic risks such as the economic cycle in their risk appraisals, thus again via the process of competition, helping to reduce the prudential standards for the whole market. Hit and run entry as predicted by the theory of contestable markets must by its nature have a short time horizon.

50 As predicted by the theories of credit rationing, these mechanisms are likely to lead to a deviation between subjective and objective probabilities of financial crisis, a state in which a shock can lead to a sudden reappraisal of lending policies, an increase in credit rationing and crisis. Such a deviation helps to explain a potential paradox in the paradigm suggested here, namely that despite falling sunk costs, entry occurs but, despite an (objective) deterioration in market conditions, no exit until it is too late.

51 Again, theories of financial crisis stressing uncertainty noted that profits are earnt in competitive markets by innovating where there is uneven information and uncertainty. But fragility may follow heightened innovation it it leads balance sheets to deteriorate and/or if intermediaries fail to understand the properties of their innovations. Tendencies for innovation are heightened during periods of intense competition in markets as firms attempt to use innovation to gain a stable clientele, and it was noted above that innovation and product differentiation is a key instrument for strategic competition by both incumbents and entrants.

**(iii) Features of industrial competition**

52 Besides the features outlined above, which are of particular importance in financial markets, there are several more general features of competitive processes that may cause overshooting of competitive equilibrium. Firms earning normal profits on their existing products may all be simultaneously attracted to situations offering potential for

growth but individual firms are unable to predict in advance whether rivals will follow. Such tendencies will be particularly marked if there is no clear ordering of firms in terms of likelihood of success. Once investments are sunk, entry decisions may be difficult to reverse. Moreover, if there are sunk costs, firms may find it optimal to stay in the market for some time even if they make losses, as they will lose sunk costs of reputation etc if they leave.[11]

53 Competition for market share as stressed by managerial theories of the firm - an approach frequently adopted by entrants or in new and developing markets - may lead to cumulative reductions in market prices until it is checked by losses for participants and withdrawal or retrenchment. Such competition may persist if participants can cross subsidise[12] their operations from others making excess profits elsewhere (ie there is a market failure elsewhere) and they are relatively immune to takeovers. As well as in prices such competition may also be manifested in strategic moves (excessive innovation, r&d, or product differentiation) which given the mechanisms outlined above may also have systemic consequences.

**(iv) Regulatory features**

54 An appropriate response to excessive competition in financial markets is regulation, as discussed below. But it must first be noted that inadequacies in regulation may heighten tendencies to excessive risk taking. For example, if deposit insurance covers all deposits, and premia do not adequately reflect the relative risks of different types of institution, it may promote under-capitalisation and risk taking by intermediaries, even if they are profit maximising rather than seeking market share.

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11 There are analogies with trade theoretic behaviour of exporters attempting to break into a market [see Dixit (1987)].

12 That is, provide funding to a loss making operation at terms cheaper than those attainable in the capital market.

55 Overshooting may also be caused by excessive provision of lender of last resort facilities. If it is known that all firms getting into difficulties will be saved, competitors (in particular new entrants) will have incentives to take excessive risks, ignoring the externalities imposed on other intermediaries (who also help finance the lender of last resort) and on the lender of last resort itself. Moreover, lenders in the interbank market may not have the correct incentives to discriminate between banks (by price or quantity rationing) and discourage risk takers.[13]

**(v) Previous market situations**

56 It is appropriate to consider at this point whether a distinction should be made between different types of competition and market structure prior to reduction of entry barriers, and the way in which entry barriers are removed. Are firms that were previously uncompetitive more prone to excessive competition? Is deregulation more likely to provoke risk taking than other types of easing (technological progress, innovation, new markets)? These are partly empirical questions, addressed in section V below, but some considerations can be suggested. On the one hand, firms used to operating on uncompetitive markets may be more cautious in entering new markets than more competitive rivals. On the other hand they are also likely to be X-inefficient and may thus find it hard to adapt to sudden changes in competitive conditions. As regards deregulation, in the short term, uncertainty is likely to be greatest in the case of deregulation of a previously uncompetitive market, because the dynamics of supply and demand in a competitive situation are totally unknown. In contrast, a decline in barriers to entry in an established competitive market at least occurs in the context of known competitive behaviour. But in the long run, given the changes likely to arise from new entry itself as outlined above, it may be wrong to distinguish these cases.

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13 Though this is partly also an information problem.

## (f) Summary

57 This section has sought to develop a framework for analysing the development of financial fragility based on an industrial-organisation approach to the process of competition between financial intermediaries. Broadly, it suggests that declining sunk costs of entry may lead to increased competition, which due to various imperfections and market failures may become excessive in relation to long-run competitive equilibrium and lead on to financial instability.

58 While being distinct in its primary focus on structural aspects, the framework also seeks to encompass the mechanisms and predictions of existing theories. Thus uncertainty, imperfect information, features of regulation as well as more general aspects of the competitive process are among the mechanisms that help lead competition to become excessive after declines in entry barriers. Such competition is likely to lead to changes in credit rationing, entailing increased debt growth, as well as reduced capitalisation, which leaves the financial system vulnerable to shocks such as abrupt monetary tightening.

59 Indicative evidence (based on case studies) is provided in the next section.

## V Financial Instability in the 1970s and 80s

60 In this section the evidence of various recent periods of financial instability is assessed to judge the realism of the mechanisms identified in Section IV. A complete description of these events is provided in Davis (1989) [sections (b), (c), (d) and (e)], Reid (1982) (a) and Bellanger (1989) (f).

### (a) The Secondary Banking Crisis

61 A number of industrial features can be discerned in accounts of the UK secondary banking crisis [see Reid (1982)]. For example, the sunk costs of entry to banking markets were eased by the development of wholesale money markets, which reduced the need for banks to develop a retail deposit base and an expensive branch network. Moreover the deregulations of 1958 (liberalisation of fund raising) and 1971 (competition and credit control) eased access of the secondary banks to wholesale funds per se and funds from UK clearing banks, respectively. These reduction in entry barriers precipitated the development of secondary banks, while granting of licences was also at the time a relatively unregulated process. The scale of new entry can be judged from the fact that 87 new firms obtained banking licences in 1967-70 and a further 46 in 1970-3.

62 The development of secondary banks permitted increased and concentrated lending to property and financial companies who had previously either not existed or whose demand for funds had been credit rationed for reasons of risk and regulation (direct controls on bank credit). (There was thus evidence of "herding" to a new group of borrowers where due to lack of relationships, information links etc entry barriers were low.) However, once the market developed, and following the 1971 deregulation, clearing banks themselves also began to lend to property companies, as part of the more general expansion of their balance sheets. (This could also be seen as a form of strategic competition; pricing low to compete with new entrants.) Leverage of borrowers increased sharply; many loans were backed by assets such as equities and property which proved in retrospect to have unsustainable market values. For following the monetary tightening and general economic crisis of 1973-4 such collateral devalued rapidly.

63 The collapse of the secondary banks was at the centre of the crisis. They had, arguably, lent on inadequate information regarding systematic risk itself, ie the vulnerability of their loans in the case of a normal cyclical downturn (though it could be argued that the oil crisis was an unprecedented occurrence) as well as concentrating their risks, not building adequate capital and relying on what proved to be unstable sources of funding in the wholesale markets.[14]

**(b) Herstatt**

64 This 1974 crisis can be viewed on two levels; the interbank market which funded the banks concerned and the forex market in which the initial losses were made. The rapid development of the international interbank market entailed rapid new entry to the market, thus compressing spreads,[15] while the relative novelty of the market itself and lack of experience by lenders probably led to inadequate appraisal of risks. Certainly, the reaction of lending banks in the interbank market to the crisis - where information was imperfect to discriminate sharply between risk classes, and where information was more readily available to limit the amounts of maturities of loans to a particular bank to their net worth or other quantitative guidelines - were policies that prudent lenders should have carried out in any case. Evidently, desire to increase assets and market

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14 Indeed, Grunewald and Pollock (1985) suggest that unlike the stock market which price risk over a continuum, the money market is a rationing device that reacts discontinuously to risk. Either a bank is regarded as sound and can borrow at the market rate, or it cannot borrow at all.

15 See, for example, Brimmer and Dahl (1975) who discussed the expansion of US banks' overseas branch networks after introduction of the Voluntary Foreign Credit Restraint Programme (1965-74), which restricted foreign lending from head offices in the United States. Claims on foreign banks by US overseas branches rose from $6.1 billion in 1969 (20% of assets) to $61.1 billion in 1974 (40% of assets). The authors also noted "the competition to place funds in the interbank market led to a significant narrowing in lending margins, and this had a significant adverse impact on the profitability of the foreign branches..."

share had driven spreads too low and led lenders to disregard the potential for instability.

65 In the forex market, the switch to floating exchange rates increased opportunities for profit (as non-financial firms sought forward cover) thus attracting new entrants and leading existing firms to increase their exposures. Given technology and the availability of interbank wholesale funds, sunk costs of entry were evidently low, and competition for business was fierce. Extremely risky practices[16] such as banks covering forward transactions by spot transactions plus euro-currency borrowing, were common. On the one hand, it appears that many banks failed to understand the dynamics of the forex market: perhaps understandably given the long history of fixed rates. On the other hand heightened competition was a factor driving them to make little allowance for risk. The crisis was precipitated by failure of the Herstatt Bank in Germany, due to foreign exchange losses, following unexpected depreciation of some currencies and a tightening of US monetary policy. That the problem was more widespread is shown by the fact that many other banks also suffered losses.

**(c) The Debt Crisis**

66 The growth of lending to ldcs in the 1970s again showed many of the features outlined above. The development of the syndicated credit reduced the sunk costs that banks needed to incur in order to enter the international markets, as a single deal could involve many banks with only one set of documentation, credit appraisal etc. Small banks could rely on credit appraisals made by larger banks having relationships with borrowers. Meanwhile the deposits of oil exporters after 1973 provided a ready source of funds and the deficits of oil importers led to sharp increases in the demand for external finance.

67 All these features encouraged rapid new entry to the market after it had recovered from the disruption of 1974-5 associated with the Herstatt Crisis. An account of the

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16 Which could also be seen as strategic innovations.

development of indebtedness [Johnston (1983)] illustrates the relaxation of standards of risk appraisal which followed. "Spreads for prime borrowers began to decline in 1976 while loan size increased; lower spreads and longer maturities for other borrowers followed in 1977 and 1978. Many borrowers began to tap the market regularly, and a wider range of borrowers entered the market, including ldcs. Some borrowers re-negotiated or refinanced loans taken out under tighter conditions, despite increasing ratios of debt to exports".

68 A number of accounts note the industrial organisation features that underlay these patterns. Briault and Bond (1983) suggest that during the 1970s banks competed aggressively for deposits and loans, stimulated by factors such as an increasing focus on balance sheet growth rather than merely profitability; a shift from asset to liability management; ability to cross subsidise international business from profits made in oligopolistic domestic markets; misjudgement of the risks, notably the potential correlation of sovereign risks in a recession, the lack of conditionality to sovereign debtors (and the potential for tightening of US monetary policy). One reason risks may have been misjudged was that participants in syndicates were often new entrants lacking adequate information, who were willing to leave risk appraisal to the lead bank, while the latter, having a small share of the risk and gaining fee income from the deal, had incentives to underplay the risk. Moreover, the growing intensity of competition itself tended to reduce spreads (suggesting sunk costs were low). Finally, banks were misled by the short maturities of their loans into believing that they could always reduce or eliminate their exposures at the next rollover date (an "illusion of liquidity"). This was dependent on other banks filling the gap, which in 1982 they proved unwilling to do.

**(d) The Crisis in the Floating Rate Note (FRN) Market**

69 The invention of the floating rate note long predates the bull market and crisis that occurred in 1986, but a major spur to development of the market was given by the debt crisis, which led to sharp declines in syndicated credits, necessitating development of markets in substitute instruments as assets of banks and liabilities of companies and sovereigns (as well as for banks themselves to rebuild their capital by issuance of subordinated debt). Increased demand led to new entry of investment banks as

intermediaries; competition to offer finer terms to borrowers led to downward pressure on yields, which fell below libor in 1986. This tended to exclude banks as investors, given their interest in FRNs was premised on obtaining libor (at least over the medium term) although they held 80-90% of extant bonds. This pattern suggests intermediaries failed to understand the market.

70 Lead managers sought to compensate, by innovation (as well as employing innovation as a means of strategic competition between themselves), which relied on risky interest rate plays, while heavy trading by investors in an attempt to maintain profits further compressed spreads. Intermediaries (and investors) assumed risks were limited by the coupon reset mechanism and build up large positions, failing to note that profits and liquidity were largely a function of bull market conditions. The market entered a crisis at the end of 1986, with falling prices and a complete halt to new issues following the announcement of new capital adequacy guidelines (excluding some FRNs from bank capital), excess supply of bonds, re-evaluation by investors of the equity characteristics of perpetual frns, and perceived illiquidity of innovative products.

**(e) The Equity Market Crash**

71 The crash itself may be seen largely as a speculative bubble in asset markets, and as such it was partly divorced from the type of changes in industrial structure stressed above, [though it is notable that in the United States it was preceded by strategic innovations such as portfolio insurance, which were promoted heavily by investment banks aiming to promote their fund management services and may have given investors "illusions of liquidity"]. However, systemic risks associated with the crash arose from debt claims, and events in these markets did have an industrial angle. We assess first underwriting exposures, and second leveraged situations.

72 One of the principal concerns of the markets at the time of the crash was associated with underwriting exposures, notably following the sale of part of British Petroleum by the UK government. United States and Canadian investment banks, seeking market entry, undertook "bought deal" type underwriting, despite the

considerable length of time over which the risk would be held, namely one week compared with less than a day for normal deals, and their rather low capitalisation in relation to such risks. Such firms appeared ready to sustain considerable risk to enter the market and gain the sunk cost of a reputation for successful underwriting (it should be noted that sub-underwriting is not possible in the United States). As a result of their exposures to rapidly devaluing unsold equity, commercial banks threatened to cut credit lines to the securities houses concerned. Only the intervention of the Fed (the announcement that liquidity would be provided) and the UK announcement of a support price for BP helped to calm the markets.

73 A second feature of debt markets prior to the crash was the rapid build up of debt by the corporate sectors of a number of countries [see, for example, Davis (1987)]. Associated developments included the development of the junk bond market, (which reduced the incidence of credit rationing in banking markets), wider access to eurobond markets by firms of low credit quality, and innovative debt financing methods such as the leveraged buyout, all of which were introduced as part of a process of strategic competition and new entry by investment (and to a lesser extent commercial) banks. These changed market conditions led to further increases in competition among suppliers of funds and what proved in some cases to be inadequate risk appraisal.

74 The main casualties of the crash in terms of leveraged firms were those whose loans were backed by (overvalued) equity claims, typically following acquisitions undertaken during the speculative period. Some found themselves quantity rationed in credit markets and a few had to default. But generally the price of debt increased and many borrowers were driven to more expensive markets (bank lending rather than bonds).

**(f) The US Thrifts Crisis**

75 The initial crisis for thrifts (1980-2) was caused largely by the effects of changes in US monetary policy and adverse economic conditions on a heavily regulated industry, where risks were heavily concentrated on the intermediaries (funding fixed rate loans with floating rate deposits). However, an important industrial feature was the growth of money market mutual funds, whose entry to the deposit market was facilitated by declines in sunk costs resulting from technology as well as deregulation. Because their

rates were not subject to ceilings, these provided important competition for the thrifts when monetary tightening drove up interest rates, effectively disintermediating them from deposit markets. As a result of thrifts' initial problems, deposit rates were deregulated as were lending powers (thrifts were empowered to offer adjustable rate mortgages and non-housing loans). Capital standards were relaxed.[17] Lower interest rates also afforded some relief.

76 A further, more serious, crisis followed beginning in 1984. Although the collapse of primary product price was a key factor in this,[18] thrifts evidently also lacked the expertise and information required to lend prudently outside their traditional fields, (even if one excludes those thrifts which deliberately sought risky loans as a gamble, prompted by the moral hazard offered by deposit insurance). In particular, they financed the high volume of what proved to be speculative real estate investment, which both proved unprofitable itself and also drove down the prices of existing real estate, often below the value of mortgage debt. They also invested heavily in junk bonds. Again, this is an example of new and under-capitalised entrants to markets (when barriers to entry caused by regulation are removed) acting in a herd-like manner, demanding inadequate risk premia and operating price rationing of credit when quantity rationing may have been more appropriate.

**(g) Summary**

77 The industrial features of the crises discussed and numerical evidence on entry are summarised in the tables below. They show that most of the industrial features highlighted here were present in each case, and new entry was rapid.

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17 The chief federal regulator (the FHLBB) had jurisdiction over the FSLIC insurance fund, which was inadequately financed. The FHLBB also had a close promotional relationship with the thrift industry. Capital forbearance, rather than thrift closures (which would have caused FSLIC bankruptcy) was the resulting policy.

18 Regionally - concentrated balance sheets (due to geographic restrictions on expansion) made institutions vulnerable to such changes.

78 Three caveats are in order. First, we note that, depending on the nature of the cost function, some entry without systemic implications can be expected to arise normally with economic growth. A judgement must be made whether actual entry exceeds this level; however, a reasonable benchmark may be entry in relation to longer term patterns of entry, which in all sectors has been fairly slow. Second, there will come a point when a new intermediary is sufficiently established that some of the imperfections (information and uncertainty) specific to new entry may cease to operate. In our judgement this requires experience of a full cycle, ie longer than the period shown. Third, entry is of course not the only feature highlighted in this paper as indicating increased competition. In contestable markets prices may fall without entry occurring; strategic competition may be manifested in heightened innovation etc as well as predatory pricing.

**Industrial Aspects of Financial Instability**

| | Secondary banks | Herstatt | Ldc debt | FRN | Crash | Thrifts |
|---|---|---|---|---|---|---|
| Reduction in entry barriers due to: | | | | | | |
| Deregulation | Yes | - | - | - | - | Yes |
| Innovation | - | - | Yes | Yes | Yes | Yes |
| New Markets | Yes | Yes | - | - | - | - |
| Technology | - | Yes | - | - | Yes | - |
| Developments in existing markets | - | - | Yes | Yes | - | Yes |
| New entry of firms | Yes | Yes | Yes | Yes | Yes | Yes |
| Entry of new market by existing firms | Yes | - | - | - | - | Yes |
| Lower prices in credit markets (declining risk premia) | Yes | Yes | Yes | Yes | Yes | Yes |
| Low or declining capitalisation | Yes | Yes | Yes | - | Yes | Yes |
| Higher quantities in credit markets (increasing indebtedness of borrowers) | Yes | Yes | Yes | Yes | Yes | Yes |

**Aspects of periods of new entry when instability did not arise (Section vi)**

| | Mortgages | Big Bang |
|---|---|---|
| Reduction in entry barriers due to: | | |
| Deregulation | Yes | Yes |
| Innovation | - | - |
| New Markets | - | - |
| Technology | - | - |
| Developments in existing markets | - | - |
| New entry of firms | Yes | Yes |
| Entry of new market by existing firms | - | - |
| Lower prices in credit markets (declining risk premia) | - | - |
| Low or declining capitalisation | - | - |
| Higher quantities in credit markets (increasing indebtedness of borrowers) | Yes | - |

Indicators of market entry prior to instability

| | Years | t-5 | t-4 | t-3 | t-2 | t-1 | t |
|---|---|---|---|---|---|---|---|
| Secondary banking[1] | (1973) | +29 | +29 | +12 | +12 | +11 | +11 |
| Herstatt[2] | (1974) | +27 | +26 | +12 | +17 | +17 | +4 |
| Debt crisis[3] | (1982) | +7 | +15 | -7 | +6 | +57 | -23 |
| Frns[4] | (1986) | +15 | -10 | -3 | +25 | +1 | -9 |
| Crash (loans)[5] | (1987) | -25 | -72 | -16 | -28 | +5 | +45 |
| (bonds)[6] | (1987) | +13 | 0 | -5 | +19 | +15 | -6 |
| Thrifts | (1984) | see note 7 | | | * | | |

1 New authorisations of banks (interpolated).
2 Net increase in number of US banks with overseas branches [source: Brimmer + Dahl (1975)] - data for other countries not available.
3 Net increase in book runners in syndicated credits to ldcs.
4 Net increase in lead managers in frn market.
5 Net increase in book runners in syndicated credits market.
6 Net increase in lead managers in eurobond market.
7 In this case there was new entry to non traditional markets (adjustable-rate mortgages and non-housing loans) by the whole thrift sector due to deregulation, which occured at t-2(*).

## VI New entry Without Instability

79 It is relevant also to consider the features of periods of deregulation and new entry that occurred without provoking instability to see what distinguishes them. We assess two; deregulation of the UK mortgage market and Big Bang.

80 The mortgage market in the United Kingdom has been traditionally the preserve of the building societies, banks often having been constrained from expansion into this market by direct controls on lending. However, the abolition of such controls in 1979-80 together with the loss of lending opportunities elsewhere (due to the debt crisis and domestic economic downturn) led to rapid entry by the banks . Once permitted to enter by deregulation, banks found it easy to vary their scale of involvement in mortgages via transfer of staff (ie they could easily exit from the market as well as enter, implying low sunk costs and contestability). New entry led to increased gearing of mortgage borrowers and (given increasing house prices), extremely rapid growth in mortgage debt outstanding.

81 Although there was new entry and growing debt, several features of this market may have helped prevent instability. First, both existing firms and new entrants were adequately capitalised (as well as being subject to firm supervisory oversight), thus affording a protection against loan losses and reducing incentives to make excessively risky loans. Second, mortgage interest rates remained higher than wholesale costs of funds to a greater extent than they had in the 1970s when credit was rationed (since credit had previously been "disequilibrium"[19] quantity-rationed, new entrants did not need to offer significantly lower rates to gain business). Mortgage loans are in any case variable rate, in common with deposits, so there is no mismatch. Third, supply constraints on housing helped prevent rapid falls in house prices even when policy was tightened. Fourth, apart from the deregulation of building society lending in 1986, neither group of institution was shifting radically into new areas of business in which

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19 See paragraph 40.

they might be unaware of the dynamics. Finally, banks often already had relationships with customers to whom they were making mortgage loans. Most of these features contrast with the US thrifts crisis.

82 Big Bang in the City entailed the entry of international banks and securities houses to the UK stock exchange, which together with the abolition of separation of agency and market making led to creation of a large number of integrated securities operations. There was evidently excessive entry in relation to potential market capacity, because most firms were soon making losses, while the relative success of previous incumbents suggests a role for sunk costs related to intertemporal advantages and strategic competition.[20] However, despite the Crash and the reduction in the stock of gilts, firms have to date either remained in the market or withdrawn quietly without any disruptive bankruptcy or systemic risk.

83 A number of features may help explain this situation. First, firms have always been adequately capitalised and firmly supervised. Many are subsidiaries of international firms with profitable (oligopolistic) business elsewhere. Most firms entered by acquisition of existing firms and hence did not suffer from poor information on entry. Finally, and perhaps more tentatively, risks in secondary-market trading may be less acute than those in primary issuance or bank lending (which helped provoke the crises discussed above).

84 The key features distinguishing these periods thus appear to be adequate capitalisation, firm supervision and reasonable levels of information for entrants.

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20 The case is similar to that of eurobond issue discussed in the Appendix.

## VII Conclusions

85 This paper suggests that many of the factors which are held in theory to underly the development of financial fragility can be analysed in the context of theories of industrial organisation, while industrial organisation can itelf contribute to understanding of the genesis of fragility. Examination of situations of instability reveals that a number of the factors highlighted were both present and helped to explain the growth of debt and declining risk premia.

86 Notably, one can trace reductions in entry barriers, due to such factors as deregulation, innovation, new markets, technological advance and developments in existing markets, followed by actual new entry of firms and/or entry of new markets by existing firms. Consequences are as predicted by the theory as outlined, namely declining risk premia, increasing indebtedness and (generally) low or declining capitalisation. The transmission mechanism between entry and fragility includes features such as lower levels of information, heightened uncertainty over market responses and herd-like behaviour among lenders, as well as the more general consequences of heightened competition in terms of prices and quantities.

87 Given the results, it is relevant, first, to consider how excessive competition can be prevented - or its effects minimised, - while retaining the benefits of efficient markets. Obviously risk can be minimised by extremely strict regulation, segmentation and direct controls on prices and quantities of credit, but this may cause inefficiency which more than offsets gains in terms of risk reduction.

88 Basically, some form of "regulatory" insurance such as the lender of last resort and deposit insurance remains vital to prevent systemic risk, but to prevent associated moral hazard, it is necessary to enforce capital adequacy requirements. In addition, it is appropriate for lenders of last resort not to save managers and shareholders of a failing institution, for there to be uncertainty as to whether such intervention will occur, and for deposit insurance protection to be limited to more vulnerable and less informed depositors. Moreover, where assumption of risk leads to potential systemic problems there is a case of directly limiting risk exposures of those involved, eg by limits on large

exposures or concentration of risk on particular types of borrower. Credit rating agencies may have an important role to play complementary to the regulatory authorities in assessing financial fragility. Finally, a central debt registry may help overcome inadequate information on lending to individual customers - if all lenders co-operate.

89 As well as buttressing various approaches to regulation, the results may also be of direct use both to regulators and market participants. Although the regulatory mechanisms noted above should in principle be effective against "excessive" competition, even if it were not detectable ex-ante, some problems may arise. First, late detection of such a situation may require regulation to impose higher costs than early detection; second, the implications of changing prices and quantities may on occasion be ambiguous; and third, there may be a tendency ("disaster myopia") whereby perceptions even of regulators may be distorted by a period of calm financial conditions (or competition itself) so that they accept prevailing judgements of risk and thus fail to detect excessive competition. To avoid the problem of late detection, a leading indicator should be useful, while to interpret changing market conditions and to help prevent disaster myopia, even an additional coincident indicator (in addition to prices and quantities of credit themselves) should be of assistance.

90 It is suggested that a sharp focus on the industrial dynamics of competition in financial markets can provide such indicators. First, changes in sunk costs of entry must occur in advance of associated entry, while even the latter is likely to take time before it impacts on prices and quantities of credit. These suggest that such changes have leading indicator properties and will signal that changes in capitalisation etc should be monitored particularly rigorously.[21] Second, even if not detected in advance, changes in entry barriers and associated new entry may help regulators to

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21 Of course, the indicator has qualitative and not quantitative properties. The time lag between changes in entry conditions and crisis in the examples given above is highly variable.

interpret changes in prices and quantities (eg the extent to which they are likely to be associated with deteriorating information, heightened uncertainty and associated overshooting of competitive equilibrium, rather than being an orderly removal of oligopoly rents). Third, by offering an extra indicator, focus on industrial dynamics may help minimise disaster myopia. Finally it should be noted that in each case it is important for regulators to understand the type of competition (and hence sunk costs, economies of scale and associated technology) in each of the markets for which they are responsible, as this will influence the way in which the various transmission mechanisms and excessive competition per se will manifest themselves.

91 Not that use of the results needs to be confirmed to ongoing regulation. The design of policies of deregulation, as well as of responses to new developments, may be aided by consideration of market dynamics. To offer two topical examples, will opening up of some currently uncompetitive EC markets after 1992 - when Europe will witness both cross border and functional deregulation - lead to fragility? Monitoring of entry may help prediction. Second, how should Eastern European countries liberalise? Sudden elimination of entry barriers may not be the most appropriate solution, unless strong safeguards against systemic risk are in place.

APPENDIX

**The Industrial Economics of the Eurobond Market**

92 Davis (1988) assessed whether theories of industrial organisation offered insights into the behaviour of the eurobond market. It is useful to recapitulate some of these conclusions in the context of this paper, to enable the reader to assess in more detail the contribution industrial economics can make to analysis of financial market behaviour.

93 He concluded that on the face of it, the market appears to have many of the features of a contestable market. On the side of contestability, 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.

94 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. 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. Offered the same price for an issue, borrowers will choose an existing firm, given their reputation for successful launched, 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.

95 Recent experience suggests that these advantages of existing firms can only be offset in 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 [Aliber (1984) suggested this factor also enabled Japanese banks to undercut US banks in the eurocurrency markets]. These enable such entrants to charge a lower price than incumbents at the same profit margins. 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 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 (on the demand side) and expertise (on the cost side) build up over time.

96 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 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.

97 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 duplications is arguably a deadweight cost to society. Meanwhile the invention of 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 long-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 may 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.

98 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 interest 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 important. Borrowers are increasingly ready to deal with several firms rather than merely a "house" bank. The investment bank wishes to maintain 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.

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