# Banking and the Financing of Development:
# A Schumpeterian and Minskyian perspective[1]

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*Schumpeterian creation and destruction occurs in finance as well as in products and processes. The essential point of Schumpeter's view of money and banks is that new combinations in production and in products could not appear without being financed: finance and development are in a symbiotic relation. Restricting the Schumpeterian vision to technology or even industrial organization misses the integrated character of Schumpeter's vision. (Hyman Minsky, 1990)*

## 1. Introduction

This chapter uses the theoretical traditions associated with Schumpeter, Penrose and Minsky to examine the role of competition and capabilities in finance and in economic growth.[3] From that perspective, two aspects of the role of financial firms in economic growth and dynamics are important. One is the crucial role played by financial firms in providing manufacturing firms with the credit they require to engage in the competitive process of creative destruction. The second is the competitive behavior of financial firms themselves, which transforms financial markets and, in turn, affects the ability of all firms to finance new innovations. The uncertainty and risk that underlie Minsky's financial fragility hypothesis are seen to result from Schumpeterian innovation, and spur further innovations. And knowledge-based innovation is a key strategic response to an environment of uncertainty and financial instability: Financial innovations that facilitate the financing of innovation in business tend to decrease transparency concerning the risks being borne in the system, raising the possibility of ever-increasing financial risks and ever-decreasing understanding of the extent of these risks.

These considerations suggest that developing countries should be given the means to mold national financial structures which best facilitate the growth of knowledge-absorbing sectors (Christensen, 1992, Nelson, 1993), given their economic and social structures, their historical trajectories, and their institutional inheritances. But this does not mean that each nation will be able to identify a single financial model that facilitates growth and minimizes risks at every point in its development process. Growth requires financing, and both the process of

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2 Senior Inter regional Adviser, United Nations Conference on Trade and Development, and Professor of Economics and Business, Candido Mendes University, respectively.
[3] Minsky, while a noted Post Keynesian, often commented on the affinity of Schumpeter's and Keynes' views on finance; see Minsky (1986, p.113) and Minsky (1990).

growth and the process of financing growth are inherently volatile and unstable, as both Schumpeter and Minsky emphasized.

The next section briefly sketches out two approaches to the firm inspired by the ideas of Schumpeter-Penrose and Minsky. The two sections that follow then summarize Schumpeter's and Minsky's ideas about the role of finance in economic dynamics, in light of these ideas about the firm. Competition and innovation in the financial sector are discussed, followed by attention to the impact of globalization, especially on developing nations. Two case studies of the provision of Schumpeterian finance are then considered, those of Germany and the US. A brief discussion of policy implications and a short summary conclude the paper.

## 2. Schumpeter, Penrose and Minsky on the Firm: Knowledge-Based and Cash-Flow Approaches

**2.1 -The Knowledge-Based Approach to the Firm .** Schumpeter understood capitalism as an historical process whose defining feature is not equilibrium (as in the neoclassical canon), but change. Chandler (1990) validates Schumpeter's conception by providing historical chronicles that illustrate how firms compete in market settings. He shows that firms engage in ongoing struggles not simply to survive, but to achieve and hold dominant market positions. In these struggles, continuous change and unforeseen circumstances are the most significant threats to firms' survival.

A key element of the firm, emphasized by Penrose, Chandler and by other theorists in different ways, is the creation and strategic management of knowledge-based resources. These resources include individual employees, teams, processes, and technologies. Some firm resources are acquired through arms-length purchases (as when new employees are hired); others are developed through processes internal to the firm. Firm managers' strategic management involves decisions about how to use existing firm capabilities, how to create new capabilities, and how to respond to uncertainty.[4]

Different authors exploring the knowledge-based theory of firm organization have emphasized different aspects of firm behavior. Chandler views managerial organisation itself as a production technique that confers "first mover" advantages. Edith Penrose (1959 [1995]) emphasizes that firms are not only more efficient in organizing factors, they are more efficient in developing new techniques which cope with changes in uncertain environments. They accomplish this by creating internal environments -- "pools of relative certainty" – capable of combining and coordinating responses to external volatility, and thereby generating endogenous innovations. These are just two ideas of many that have been proposed regarding how firms react to changing, uncertain environments. A fuller accounting of these responses would include adaptations in the existing management and organization of production, and changes in the organisation itself (Best, 1990, 2001, Lazonick, 1991, and Chandler et al, 1997).

[4] A longer version of this paper (available from the authors) shows how this strategic management involves considering when and how to reduce the uncertainty that arises from relative price instability by shifting from the use of contracted services to the hiring of employees. These considerations, of course, build on the core insights of Coase (1937 [1991]).

In any event, firms that survive invariably innovate – that is, they exploit opportunities for change by applying new ideas, methods, or combinations of resources.[5] Further, the innovation process is ceaseless. The very success of firms' reactions to competitive challenges acts to reinforce uncertainty and instability, calling forth new reactions and innovations and leading to self-perpetuating economic change. Firms thus compete continuously for market advantages, with asymmetric results: success for some, with strengthened technological and organizational capabilities, and above-average profits; failure for other firms, which either disappear or are reduced to marginal activities. Schumpeter, whose core ideas are elaborated by these theorists, put it as follows: "to escape being undersold, *every* firm is compelled to follow suit, to invest, and to accumulate" (Schumpeter: 1942 [1992] chapter 3: 32).

Competition is therefore the struggle for survival and growth in a structurally uncertain environment (Nelson and Winter: 1982, parts 2 and 5). The profits that result from dominant market positions are always under threat from imitative strategies or other firms' innovative behaviors; they can only be maintained by continuous product differentiation and productivity enhancement. The continuous competition for profit provides the dynamic connection between innovations, market structures and business and organizational strategies.

**2.2 - The Cash-Flow Approach to the Firm.** Minsky's analysis of the firm emphasizes the firm's cash flows and their sustainability in light of the borrowing required to acquire assets. Borrowing the concept of a "margin of safety" from Benjamin Graham, one of the originators of hedge fund investment, Minsky defines three balance sheet configurations: hedge, speculative and Ponzi. The asset side of a "hedge" balance sheet produces expected cash inflows that always exceed their financing costs and operating expenses, including dividends, by a margin capable of absorbing any unforeseen changes in cash inflows and outflows. If the liquidity cushion covers, say, 2.33 standard deviations of the historical data on past gross operating returns, then the firm would be unable to meet its cash flow commitments on average only one time in a hundred. A company that can meet its payments with 99% probability is close to what a banker considers risk-free – a hedge unit.

As the cushion of safety declines, the probability of being unable to meet cash flow commitments rises; at some point it will be 99% probable that in some future periods the firm's cushion will not be sufficient to meet its payment commitments. Nonetheless, the cumulative cushion over the life of the loan should be sufficient to cover them; so the project has a positive expected net present value. The firm may need an additional extension of short-term credit on occasion to meet its cash payments, but by the end of the project the loan it will have been fully serviced. This is what Minsky calls a "speculative" financing position: both the banker and the borrower are speculating that by the end of the project there will be enough money to repay the loan, despite some shortfalls along the way. A bank loan officer with good expertise in credit assessment will accept such loans.[6]

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[5] This does not mean the application of "best practices," as Nelson and Winter (1982), Paul David (1985), and Brian Arthur (1994) have stressed. Indeed, in this context the idea of "best practice" may be without analytical content.

[6] In Minsky's terms, Schumpeterian entrepreneurs are always *speculative units*, and *true Schumpeterian entrepreneurs* are quasi Ponzi units.

Finally, when the cushion of safety is non-existent and there is a high probability of shortfalls in nearly every period, the firm may have to borrow additional funds just to meet current commitments. Minsky calls this "Ponzi" financing, making reference to a well-known post-war pyramid investment scheme. These are companies that must increase their borrowing just to stay in business; according to standards of good credit assessment, bankers should not lend to such units under any circumstances (Kregel, 1997c). For Ponzi units, profits expectations are based solely on the possibility of the resale of assets at higher prices.

Building on Keynes and Schumpeter's analytical frameworks, Minsky argues that in a capitalist economy in which the future is subject to unforeseen changes, the value of hedge and speculative financing positions changes with variations in the overall macro behavior of the economy. For example, a change in economic policy that produces a rise in interest rates affects firms' financing positions in two ways: it reduces the present values of the expected cash flows from operating projects; and it increases the cash flow commitments for financing charges if interest rates are set on an adjustable or rollover basis.

## 3. A Schumpeterian *Capabilities* View of Finance, Innovation, and Growth

The innovative competitive reactions discussed above, insofar as they require additional expenditures, all can be undertaken only if they can be financed. This was a key link in Schumpeter's vision of the process of economic growth. Schumpeter considered finance as the motor force of industry; only with financing can firms appropriate the resources necessary to introduce innovations (Schumpeter, 1934 [1997]), ch. 3, and 1939 v. 1, ch. 3).

Enlarging Schumpeter's perspective involves identifying the characteristics of banks or of other financial firms that lead them to play this role in the innovation/growth process. This means accounting for the existence of banks and other financial firms within the economy. In the contemporary economic literature, many different rationales for the existence of banks have been established. One set of explanations attributes banks' existence to the advantages of large-scale operations per se. Banks may arise because they specialize in the investment of depositors' funds, and thus are more efficient than households in acquiring information about potential investment opportunities and hence in earning returns through the placement of savings. Banks' existence can also be explained by their scale advantages in monitoring the performance of borrowers. A more recent explanation attributes banks' existence to their involvement in financial engineering processes, especially the unbundling of large indivisible investments for sale to households.[7]

These approaches, while elaborating on banks' use of scale economies in achieving informational advantages, do not explain the unique role that Schumpeter attributed to the institutions financing the innovation process. The above explanations could also be used to explain the existence of money market mutual funds, which offer transactions and transfer facilities to their clients but make no loans (Mayer 1974), or the existence of collateral-based lenders. It might be more useful to begin with the two archetypal activities of the commercial bank: credit creation through lending to business firms in support of productive economic

[7] For a recent summary of this literature, see Freixas and Rochet (1997).

activity; and the proprietary purchase and sale of financial assets to benefit from pricing differentials that occur at a point in time or over time.[8] These two activity types are significant from a Schumpeterian perspective, since the form aims to increase total income and wealth, while the latter has no impact on the absolute level of income

Productive lending in the sense suggested by Schumpeter in his *Theory of Economic Development* (published in its first, German, edition in 1911) provides firms with access to the resources they require to undertake production. Lending of this type requires particular knowledge of the production process, costs, and future market conditions for the products produced by each firm to which credit is extended and thus of its prospects for repayment. It facilitates the activities of the high return, knowledge-absorbing sectors that produce dynamic industrial growth (in the same vein, see Minsky: 1990, pp. 60-65).

Management of the bank's proprietary investment portfolio, by contrast, requires information about the formation and evolution of prices in various securities markets; this process may have no relation at all to the information required to make decisions on lending to industrial borrowers. The motivation for such activity is, according to the theory of efficient markets, based on the idea that arbitrage in free competitive markets can eliminate any differences in the prices of identical titles to expected future income streams traded as financial assets. The impact of financial arbitrage is limited to the static efficiency of the competitive market process: it forces uniformity in market prices and helps allocate given resources to their optimal risk-return combinations. The successful arbitrageur profits from the elimination of such differences by being early to recognize them; by contrast, the successful borrower profits from the organizational or managerial innovations that grant the firm a dominant market position.

Both types of knowledge-based activities are carried out by many commercial banks. When carried to extremes, they are reflected in the two basic organizational forms characteristic of financial institutions: relationship or house banking; and competitive market-based activity, sometimes known as "transactional" banking. In the former, the knowledge advantage possessed by the bank involves its clients' production activities, and the potential profitability of these activities in producing the earnings needed to pay debt service and repay principal. This type of bank operation is usually associated with German Kreditbanks; US investment banks have historically played a similar role, although in a slightly different context and on a reduced scale (cf. Madeleine, 1943, Robertson, 1955, 1964, Hammond, 1967). Indeed, German banks often employed engineers and scientists to help evaluate the technology and thus the long-term prospects of borrowers to fully exploit knowledge-based advantages.

One characteristic of relationship banking is that it does not permit free market competition among banks for business; no firm would willingly provide the proprietary information required for a banking relationship to a financial institution if it thought that institution might be working for a competitor in the near future. For full information sharing between bank and borrower, confidentiality in the treatment of information must be present; this implies the exclusivity of the services provided by the bank. Neither would a firm be willing to

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[8] Such trading may be beneficial in that it provides liquidity in financial asset markets; however, the spillover benefits of such proprietary trading are greatest when markets are buoyant and do not lack liquidity, and least when markets are under pressure and traders are seeking liquidity.

offer all the information necessary to allow permit a number of competing banks to make competitive bids for its business. By contrast, financial arbitrage -- the basis of most of the transactions activities of banks -- is based on knowledge of particular characteristics of the payment flows represented by financial assets, the prices of these assets that prevail in the market, and/or the prices that other market participants expect to prevail at futures dates and places. One might say that the relationship bank is speculating on the nominal profitability of an innovative industrial process embodied in the firm that it is financing, while the transactional bank is speculating on its ability to identify anomalies in the efficient operation of the market mechanism and the on the capacity of market competition to eliminate these anomalies.

In this regard it is important to remember that although financial institutions have certain peculiar characteristics and function in a special regulatory environment, they are nonetheless business firms and compete much like other firms. So just as the industrial structure is driven by competition, financial institutions seek to earn profits from the exploitation and protection of the various knowledge-based advantages they have acquired. That is, organizational and production advantages will produce dominant competitive positions which can only be challenged by firms capable of reproducing innovations, or of perfecting other techniques that are more attractive to the market and hence more profitable (Burlamaqui and Lagrota, 1998, part 5).

As already mentioned, in financial systems where main banks or house banks provide relationship services, there is a tacit agreement, as well as a practical imperative, that banks do not compete for business. By contrast, market-based systems, wherein the required knowledge involves markets or instruments, but not information about clients, present the possibility of financial innovations via rapid reverse engineering. This permits the competitive emulation that provides for eminently contestable markets; financial institutions will compete for business by seeking to replicate the financial instruments and services that other institutions offers to their clients. Competition of this type can encompass either the direct confrontation of competitors or the expansion of activities into other sectors or areas of the production process. As the introduction of new information processing technology increases organizational capacity, and enhances economies of both scale and scope, financial firms can integrate additional services into their activities.[9] The creation of financial firms capable of this activity requires the evolution and concentration of financial institutions and financial markets to a size that is sufficient to achieve similar economies of scale and scope.[10] Note that this growth in financial firms' capacity makes it possible for non-financial firms too to achieve greater economies of scale and scope.

## 4. A Minskyian View of Banks, Finance and Liquidity

For Minsky, as well as for Schumpeter, debt financing is the core of the very logic of capitalist production. In exploring the link between finance and economic activity, Minsky shifts attention away from the problem of productive credit and focuses on the problems of liquidity and credit overexpansion. His work belongs to the Post-Keynesian approach to economics, a

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[9] For example, the process Chandler (1990, 28) describes -- wherein producers that achieve sufficiently large scale expand to provide wholesale and retail distribution of their outputs, thus internalizing external markets and eliminating wholesale and retail distribution costs -- has a counterpart in financial services.
[10] Mayer (1988, 1992) shows the impact of these changes in the organization of financial firms on the operation of financial markets.

perspective that takes money and finance (rather than technology or innovation *per se*) as the most important organizational features of capitalist systems. The Post Keynesian view emphasizes the crucial importance of uncertainty and liquidity preference in understanding the multiple rationalities for, and the volatility that guides, investment decisions; it also explores the implications of these elements for economic instability. Minsky emphasizes the need to fully incorporate *real world phenomena* - and specially finance - into the core of economic analysis, so as to grasp the *intrinsically unstable* nature of capitalist economies.

Minsky's "Wall-Street Paradigm" develops a theory of endogenous macroeconomic instability by connecting the dynamics of debt structures and interest rates. According to Minsky, modern capitalism could only be understood via this approach, which he explained as follows:

> "Looking at the economy from a Wall Street board room, we see a paper world - a world of commitments to pay cash today and in the future. These cash flows are a legacy of past contracts in which money today was exchanged for money in the future. In addition, we see deals being made in which commitments to pay cash in the future are exchanged for cash today. The viability of this paper world rests upon the cash flows (or gross profits after out-of-pocket costs and taxes) that business organizations, households, and governmental bodies receive as a result of the income-generating process" (Minsky, 1982, chapter 3, p. 63).

In his vision, understanding money means understanding a vital process shaping a social evolution whose future course remains open-ended and contingent. In this sense, Minsky's theory should be taken as an essentially institutionalist one, in the sense that he viewed the structure of the economic world - much as did his former teacher Schumpeter - not as immanent in some set of underlying data (such as endowments or technology) but rather as constituted by a set of key economic institutions. Money was the most important of these. His way of fleshing out that idea was to look at every economic unit – firms, households, governments and even countries – as though it was a bank balancing cash inflow generated by a stock of assets against cash outflows required to maintain the liabilities created to acquire those assets. From that point of view, categories of activity such as production, consumption, trade and investment represent, first of all, exchanges of stocks of real and financial assets with particular monetary flow characteristics and attached conditions. To put it bluntly, money and finance are *the most real aspects of capitalism*, from everything else springs.

In this approach, the most basic element of the economy is cash flow, and the most basic constraint on economic behavior is the "survival constraint," which requires that cash outflow not exceed cash inflow if existing stock positions are to be maintained (Minsky: 1978, 157). Because the exact coordination of payments is impossible, even this simple constraint involves finance. From that perspective, finance and financial relationships are fundamental because they *oxygenate* economic units, allowing them to purchase without previous savings; and they make growth and structural transformation possible, by providing current purchasing power to those who would use it to expand the boundaries of the system.

However, in Minsky's thinking, finance has a double-edge quality. The other side of the "positive" roles mentioned above is that finance allows economic units to become illiquid in the present (by way of cash commitments) in exchange for the *possibility* of recovering liquidity (plus profitability) in the future; specifically, it permits these units to acquire assets whose expected cash-flows will exceed the cash commitments entered into to acquire them. Thus finance allows the undertaking of future commitments that may turn out to be impossible to fulfill. Failures of expectations realization then take the form of liquidity crunches, or in severe cases, of insolvencies and bankruptcies.

The subjectivity and volatility of expectations thus make financial asset prices more volatile than other prices in the economy (Keynes: 1936 [1983] chapter 12, Strange: 1998). Secondly, given the inherent volatility of financial asset values, liquidity provides an important "protective device" or "defensive strategy" to manage uncertainty, for two reasons. First, since money is the unit of account its value is less volatile and more certain in terms of other goods than other financial assets; thus it represents a refuge from price volatility. Second, it provides assurance that future cash commitments can be met with certainty. Thus firms whose incomes flows are subject to fluctuation may want to hold cash cushions to make sure that they can meet recurrent cash commitments. This is the basis of Minsky's theory of financial fragility:

> "The liquidity preference schema of Keynes transformed economics into a study of intertemporal relations: not only is the future now but the past is also now. After Keynes, there was no reason to do economic theory that was presumably relevant for a Capitalist economy without examining the relations in production, consumption and finance that link yesterdays, today and tomorrows." (1990: p. 6)

Commercial banks face a series of risks, the most important being liquidity or funding risks. Commercial banks fund their lending by borrowing from the public by issuing sight deposits, which may be redeemed at any time. If the bank has lent these funds to a commercial borrower it will have to attract alternative lenders in order to avoid calling in loans. It may not always be able to do so; indeed, its liquidity or refunding risk arises because at times it may lack the liquidity to repay its liabilities and to renew this lending by finding other depositors. If the commercial bank is lending to business it also faces credit risk, for the firms that have borrowed from the bank may not be able to repay on a timely basis. The bank will have become what Minsky calls a speculative unit – that is, a unit whose required interest payments exceed its earnings -- and it will find difficulties in attracting additional deposits. Finally, a bank that funds lending at interest by issuing liabilities on which it has made a commitment to pay interest, must make sure that the positive differential (net interest margin) between the rate on its liabilities and the rate on its assets is maintained. If the term or the reset rate of the interest on the liabilities is shorter than that of the assets, the bank faces market or interest rate risk. Should the rate it has to pay to attract funds exceed the rate at which it has committed to lend, then a loan is subject to net present value reversal, and the bank will make losses and be unable to meet its commitments.

It is thus extremely important for a bank to present itself to its depositors as a hedge-financing unit that is able to make payments to its creditors on demand with perfect certainty. This would seem to imply holding a cash cushion against potential deposit withdrawals of 100% of the deposits, and this would imply that the bank could do no lending. But commercial banks do make business loans, so the question is how it does this without incurring unmanageable risks. The term "unmanageable" here means without running the risk of becoming a speculative unit and being unable to meet depositors' withdrawal requests. So, although banks will incur both liquidity and credit risks, they seek to make them manageable by fully hedging these risks (Kregel 1998d, ch. 7).

We may see how this might be done by considering an archetypal commercial bank that only makes short-term commercial and industrial loans of less than 90 days that are over-collateralized against goods in warehouse or contracts for sale of outputs. In this case, the value of the loan is some fraction of the anticipated realization value of the collateral. So if a borrower fails to repay, the bank takes possession of the goods and sells them for an amount equal to the value of the loan. Manageability here means making loans that are less than 100 per cent of the total value of the property pledged as collateral.

Bankers can calculate with reasonable certainty the amount of their total deposits that have to be repaid in the course of any given day. At the same time, banks can arrange their lending so that the total loans repaid each day equals the cash turnover requirement. This minimizes the amount of cash that has to be available to meet cash outflows. Since these calculations are only statistical probabilities, they have a margin of error. Thus bankers maintain a cash cushion or liquidity reserve that can be used when net outflows of funds are positive, as frequently occurs. Usually this reserve against deposits has averaged much less than 10%. When the value of collateral is less than loan value, the bank's owners can if necessary fall back on their capital to make payments to depositors. Thus, for average daily operations a bank can "safely" lend a relatively large multiple of its capital and of its deposits, with its risks fully hedged by the value of the collateral, its cash reserve cushion and the bank owner's capital. As a result, banks are usually very highly leveraged -- with gearing and deposit multipliers well in excess of 10 to 1 -- without being considered excessively risky. In this way a bank can maintain a hedged balance sheet that protects it from becoming a speculative unit (in Minsky's sense).

However, hedging the risks of a highly leveraged balance sheet does have an opportunity cost, however, since one main source of bank earnings, given a positive lending differential, is the multiple by which the bank can create deposits by lending in excess of the deposits it has borrowed from the public. To increase this ratio beyond that associated with the hedging of risk means increasing the probability that the liquidity and capital cushion will be insufficient to meet repayment requests -- and hence the probability that a liquidity crisis and a loss of confidence could produce insolvency due to demands for repayment in excess of reserves and capital resources. Thus banks also face a trade-off between risk and liquidity, which translates into a tradeoff between profitability and liquidity.

Notice that the decision on how to hedge the various risks depends on the subjective perception of these different risks and the values of the collateral pledged against loans; the type and degree of hedging will thus be representative of the bank's liquidity preference. A decision to expand credit lending through additional deposit creation, other things being equal, is thus a decision by the bank to reduce its liquidity cushion and either an explicit decision to increase risk, or a *subjective* revaluation of the bank's position that reduces the perceived risks faced by the bank or increases the collateral values pledged against loans. For example, a more optimistic evaluation of the resale value of collateral will allow a bank to increase its lending but not its perceived risk. In this case, the reliability of the new estimate of collateral value is crucial.

Consider the case of Japanese banks, which generally grant loans on the basis of collateral valuation. As the property market boomed after the Louvre Agreement in 1987 led the Japanese authorities to reduce interest rates, Japanese banks either lent to or created their own property companies, increasing their exposure pari passu with the rise in prices. These prices were being driven up by the increased demand for property, which was fueled by purchases of the property companies. Since many of these companies were quoted on the stock exchange, this increased lending to property companies fueled a rise in their stock market value and the creation of investment companies which qualified for bank lending because of the rise in the stock market value of the property companies. A vicious circle was thus created, in which the banks fueled both a property and a stock market boom without increasing what appeared to be fully hedged and thus manageable risks. When interest rates were increased and the markets turned in 1989, the banks' exposures could not be reduced to restore collateral coverage to acceptable levels and the loans effectively became valueless.

## 5. Competition, Regulation, and Innovation in Banking

The two previous sections spell out some of the dynamics of banking behavior, from two complementary theoretical perspectives. How then do banks compete? The first wisdom here is that banks compete differently depending on the state of their own balance sheets and the state of the economy as a whole. When financial institutions are competing aggressively they seek to maximize their market share; but when faced with difficulties they restrict their market expansion and compete for liquidity and/or solvency. As a result, competition in banking carries an inbuilt tendency to underestimate risks when the economy is expanding at a steady and seemingly predictable pace, and to overestimate them when the economy is in decline. It is the former that is more dangerous for the survival of the bank, and that constitutes the banking sector's contribution to the overall uncertainty and instability of the economy as a whole.

In the United States, this sort of process of banking competition culminated in the stock market crisis of 1929 and the banking crisis of 1933; in that crisis, a majority of US banks became insolvent due to a liquidity crisis that turned into insolvency, as described in Minsky's theory. Regulations were then introduced, based on the real bills doctrine, which attempted to institutionalize commercial banks and to limit their operations in financial markets to transactions services and short-term commercial lending (Kregel, 1996, Chapter 5).

To avoid such crises, most countries have introduced formal regulations, in the form of compulsory reserve ratios and minimum capital ratios, which impose bank hedging and thus create uniform standards for bank liquidity. Central banks in some countries have accepted the responsibility of acting as lender of last resort: that is, they stand ready to advance credits against a bank's doubtful assets in an emergency, thereby allowing banks to meet payment commitments even when they are in a speculative position and lack the liquidity to meet depositor withdrawals.

However, this governmental oversight has not protected commercial banks from competition with other providers of financial services. Indeed, in the past three decades, a competitive struggle has been waged between financial institutions facing different types of financial regulation. Banks have lost business to financial institutions that were not so highly regulated. The regulations covering commercial banks have limited their use of financial innovation to protect their deposit base and thus their net interest margin on normal lending activity. Thus, commercial banks have initiated primarily counter-regulatory innovations; and these have led banks to expand their activities in new directions.

This process began in the United States when a credit crunch and regulations on capital flows introduced during 1960s balance of payments and dollar crises created incentives for US banks to shift some of their borrowing operations out of the United States to “off shore” markets, primarily London. In addition to providing new sources of dollar funding for US banks, these markets provided an environment free of the segmentation imposed by US bank regulation. Commercial banks could thus operate internationally much like investment banks in the US, making many US bank global players, dealing in financial assets from around the globe.

Then in the 1970s, savings and loan institutions started to compete with banks by offering to pay interest (and in some cases a free toaster or mink coat) on transactions deposits, while commercial banks remained restricted to zero interest deposit accounts. Since regulations apply to reserve ratios and interest rates payable on deposit funds, banks innovated by seeking new sources of funds not technically classified as deposits. This was the primary source of competitive innovation in the 1970s and early 1980s (Mayer, 1974); competition within classes of depository instruments remains fierce today. Within each regulatory class, the competitive pressure is extreme: the products that a bank uses to decrease its required reserves or regulatory capital (and hence increase its earnings) are easily replicated through reverse engineering techniques that are widely known in the markets and sold publicly to clients.[11]

Further, by the late 1970s, a large share of banks’ traditional lending to corporate borrowers passed to more efficient forms of organization, such as commercial paper and money market mutual funds. Banks responded by branching out into areas such as term lending, and they deepened their involvement in offshore lending and other activities. This led to a series of lending crises involving overseas loans, one consequence of which has been the establishment of minimal risk-weighted capital/asset ratios.

Overall, these shifts have caused banks’ most important source of earnings, the net interest margin between borrowing and lending rates, to decline dramatically. To meet earnings shortfalls, commercial banks have been forced into other areas of activity, such as providing financial services to generate fee and commission income, and engaging in proprietary trading of financial assets (Kregel, 1996, 1998). These shifts have fundamentally altered bank behavior.

As noted above, proprietary trading by commercial banks requires a different type of information than does conventional lending. Earnings from financial arbitrage are based on the knowledge of prevailing market prices, and of the prices that other financial market participants expect to prevail. This shift toward fee-based income has altered the kind of information that banks collect, and the relative value of market-based and firm-based information within banking

[11] Two examples make this point. The negotiable CD, offered to business clients by First National City Bank was quickly offered by all commercial banks to their clients. The securitization of bank assets through special purpose vehicles was pioneered by Salomon in mortgage banking after the collapse of the savings and loans, but was soon extended to other assets.

firms. Further, the introduction of risk-weighted capital-asset ratios led banks to create new types of assets that either have lower risk weightings or do not appear on bank balance sheets at all (hence requiring no capital). The result has been a rash of new product innovation in which banks act as market makers in derivatives products.

These new activities represent substantially different types of risk and different tradeoffs between risks and returns, with a likely overall increase in risk. Proprietary trading, for example, carries large price risks which banks have not traditionally been accustomed to manage (Strange: 1998, chapter 2). An average US commercial bank now generates roughly one third of earnings from lending on net interest margin, a third from its proprietary trading portfolio and a third from fee and commission income. The latter is especially important because it carries a zero capital charge and virtually no liquidity or credit risk.

Finally, much bank lending is now securitized into collateralized loan obligations, which banks sell to final investors so as to move loans off their balance sheets. This frees up bank capital; it also generates fee and commission income from booking the loans and from underwriting and selling the securitized packages. Lending to firms is being done increasingly through derivative packages arranged by banks and sold to bank clients, often with banks themselves taking the opposite side of the hedges or providing subsidiary guarantees (that also are off balance-sheet). Thus, the new activities that banks are creating to protect earnings is transforming their package of risks and making it much more difficult to identify appropriate “margins of safety”. Further, innovations involving derivative contracts frequently shifts risks. It is usually argued that this process shifts risks to those who are most willing to bear them. But since identifying the true risks of derivative instruments is difficult, it cannot be assumed that those most able to bear these instruments’ risks are bearing them. This generates yet another source of potential financial instability. Overall, it is readily seen that these innovative products, practices, and strategies in the banking system have not only reshaped, but also deepened, this system’s tendency towards financial fragility.

In Schumpeterian terms, continuous product innovation is required for banks to create monopoly profits, conquer new clients, and improve competitive position against other banks. Financial product innovation diffusion occurs almost instantaneously, since patent protection is difficult to attain and information is rapidly diffused (by product imitation) among institutions. Thus, first-mover profits are ephemeral: once created, they almost instantaneously evaporate (Burlamaqui and Lagrota, 1998, part 5, Burlamaqui 2000, pp 12-19). Consequently, much competitive innovation has taken the form of rapid bank consolidation: it is easier to buy competitors than to gain a dominant advantage over them, and the gain in size leads to hoped-for gains from economies of scale and scope. Since 1980, consolidation has occurred rapidly both within and across regulatory classes (Dymski, 1999). In 1999, US banking legislation opened the way for consolidation across financial product lines, thus removing the regulatory classifications that have driven much of the competitive activity in the financial sector over the last thirty years.

## 6. Globalization, Financial Fragility and Developing Countries

### 6.1 - Exchange Rate Fluctuations and Reinforced Financial Fragility

How is our analysis affected when we consider the increasingly important global context? To begin, for firms with a high proportion of imported inputs, export sales, or foreign borrowing; depreciation of the exchange rate will have the same effect on cash flow commitments as an increase in interest rates. For countries operating in an open trading system these two exogenous changes usually occur together and reinforce one other, since higher interest rates are often used to stabilize a weak currency after devaluation.

Cash cushions or margins of safety thus are necessarily larger for firms operating in countries with open capital markets and uncontrolled capital flows (Kregel, 1997c and 1998a). For some borrowers, safety cushions will not be large enough to cover exogenous changes in both interest rates and exchange rates; these units may be transformed immediately from "hedge" finance units to "Ponzi" finance units. Shifts that reduce borrowers' cushions of safety also increase lenders' credit risk on their outstanding bank loans. Firms' borrower's risk also increases as they find it more difficult to realize the cash flows they initially expected. Overall, the *fragility* of the domestic financial system increases with either a rise in interest rates, or a depreciation of the currency.

Obviously, this same reasoning can be applied to domestic banks that borrow or lend in international capital markets. They will require higher cushions of safety against possible changes in international interest rates or in exchange rates. A bank with international operations is also exposed because a rise in interest rates and depreciation of the exchange rate also reduces the present value of its cash flows from domestic assets (represented by the interest payments received from its outstanding domestic loans), increases the interest costs of its foreign funding, and reduces the credit quality of its domestic loans. Any of these shifts reduce the bank's credit rating as a borrower, and force it to pay higher credit spreads on its domestic and international funding. If the change in rates is sufficiently large, banks may also find themselves suddenly in the condition of a Ponzi unit; in this case, banks' net present values fall below zero and institutions in this position become technically insolvent.

Banks' response to such conditions – especially if their own funding sources refuse to roll over or extend credits -- is to reduce lending to firms that are classified as hedge and speculative units, and calling in loans to Ponzi financing units. If domestic banks are also unwilling or unable to lend, the domestic inter bank market will also contract, and a generalized liquidity shortage will arise. As both firms and banks attempt to reduce their foreign currency exposure, a breakdown in the foreign exchange market may also occur. In this manner, cross-border financial linkages can readily transform a financially fragile system into a financially *unstable* system.

The consequences of these financial shifts can be dire. As noted, the special characteristics of speculative and Ponzi firms is that they need increased finance from the banks just to stay in business. In such conditions, Ponzi financing firms have no choice but to reduce their own cash outflows, delaying current payments to suppliers, cutting back on expenditures, and by attempting to raise cash in any way possible -- selling out inventories and any output they can produce at distress prices. If these measures are not sufficient to cover their cash flow needs, they will be forced to suspend investment projects, sell other assets, and layoff or fire workers.[12]

[12] Perverse macroeconomic consequences can readily follow: a generalized condition of excess supply in all markets, placing downward pressure on prices of both output and assets, accompanied by declining

Any number of factors, and not just shifts in exchange rates, can generate the scenario just outlined: among these are the tendency toward underestimation of risks in periods of sustained economic stability, periods of epochal Schumpeterian technological changes which increase optimism regarding the profit potential of new technologies, and so on. Significant balance-sheet exposure to foreign markets – either through loans or goods – reduces the size of the external shock required to trigger financial stress. Further, a period of prolonged exchange rate stability may in itself lead to over-optimism regarding the stability of the domestic currency values of foreign commitments, tempting units to reduce the margins of safety they maintain on foreign commitments. This endogenous change in margins makes the passage from a fragile to an unstable system that much more rapid in the event of an exogenous shock.

However, every period of tranquility and every technological revolution is interrupted; so expectations are eventually disappointed, challenging financial and non-financial units alike. Irving Fisher warned of a combination of events in which rising supplies and falling prices leads to a collapse in demand – a process he termed a "debt deflation." Minsky modified Fisher's description, placing more importance on the rising credit risks on bank balance sheets; increased charge-offs and a general decline in asset quality result, placing some banks in difficulty as their capital cushion is overwhelmed by loan losses, and a full fledged financial panic is threatened. In Minsky's model, this spread of fragility from the productive to the banking sector characterizes the passage from financial fragility to financial instability and crisis.

### 6.2- The Special Fragility of Developing Countries.

Minsky's original analysis of the passage from financial fragility to financial instability focused on changes in domestic monetary policy or the persistence of stable domestic conditions. This analysis is easily extended to the open economy case of an exogenous exchange rate shock, which affects companies operating in open trading systems and banks borrowing and lending in international money and capital markets. With increasingly interdependent capital markets and increased capital flows, the analysis of changes in monetary policy should be extended to encompass changes in the monetary policy of the largest international lenders.

Changes in interest rates of the major international lenders, especially the US and Japan, have been especially important in creating financial instability in developing countries during the debt crises of the 1970s and 1980s; their impact on exchange rates has been a major factor in the 1997 Asian financial crisis. However, that crisis was exacerbated by an additional element: the conditionality imposed on the borrowers seeking support from the multilateral agencies (Kregel, 1998a, 1998b and 1998c).

As noted above, the normal scenario for a developing country financial crisis involves domestic firms borrowing in foreign currency from foreign banks at interest rates that are reset at

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overall demand. In extreme cases, investment can decline due to tightening monetary policy, and consumption can fall because of declining household incomes and increased unemployment. Ironically, these developments may place additional pressure on short-term money markets, and even push short rates upwards as credit conditions deteriorate, current payments are delayed, and more units seek temporary financing to keep operating.

a short rollover period. Note that it makes little difference if the loans have a short or long maturity; the point is the change in interest costs on cash flows produced by the short reset interval for interest rates. Short reset periods mean that a rise in foreign interest rates is quickly transformed into an increased cash-flow commitment for the borrower, instantly reducing margins of safety. If the change in international interest rate differentials leads to a depreciation of the domestic currency relative to the borrowed foreign currency, then the cushion of safety is further eroded by the increase in the domestic currency value of the cash commitments and the principal to be repaid at maturity.

Developing-country governments sometimes respond to the weakness of the domestic currency in international markets by increasing domestic interest rates, with the aim of stemming currency speculation or increasing foreign demand for the currency; however, such policy steps adversely affect domestic demand, reduce domestic cash flows, and increase domestic financing costs. Firms may thus pass rapidly from hedge financing to Ponzi finance units as the result of a rise in foreign interest rates. Whether this increase in financial fragility turns to instability and crisis depends on the willingness of foreign banks to extend additional foreign currency lending to cover payment shortfalls on current commitments. If foreign banks follow the bankers' aphorism, they may be unwilling to do this.

As a result, firms may be forced to try to improve their foreign earnings by increasing foreign sales. But this usually leads to falling prices in international markets, compounding losses from depreciation of the exchange rate; any cutback in domestic operations simply makes domestic demand conditions worse. The knock-on or contagion effect thus hits both the domestic financial system and the foreign banks, which now have increasingly dubious loans on their books. If foreign and domestic banks' capital cushion is insufficient to absorb the losses, then fragility turns to global systemic instability. In any case, the initial shock and the recommended policies combine to increase fragility and thus make instability possible in any exchange rate crisis.

## 7. Perspectives on Financial Policies and Development: Germany and US Experiences

In Schumpeter's view, economic growth requires that the financial system provide a means for the most dynamic entrepreneurs to obtain resources from the dying, static parts of the economy, in a process he called "creative destruction." Schumpeter's student Minsky agreed that the financing of innovation is a core element in economic growth. This implies, as argued above, that a banking system capable of identifying knowledge-based innovation and supporting it through credit- and capital-market outlays. At the same time, the framework has shown that the macrodynamics of open capitalist economies tend to endogenously generate financial fragility, and that banking competition has shifted the information that banks rely on to generate revenue away from detailed understanding of borrower firms' capacity and toward price movements in financial markets. In other words, the banking relations that Schumpeter viewed as crucial in supporting growth are threatened by current global trends.

This raises the question of whether a different kind of banking system must be created as a prerequisite to growth based on appropriately financed competitive innovation. What can be learned from the historical experience of Germany and the US?

### 7.1- The German Experience.

The institution that provided the model and historical reference point for Schumpeter's banks was the state-owned German Kreditbank or "mixed bank." In Germany joint-stock banks played an active role in financing the innovation that led to German industrialization in the second half of the 19th century, but their role remained limited until the unification of Germany in the 1870s. The Kreditbanks founded at the middle of the century were weakened by the difficulties of the 1857 crisis. During the disturbed financial conditions of the war years they committed substantial sums in an effort to support the price of the shares of the companies they owned, thus typing up a larger proportion of their capital in holdings of company stocks than their normal operations would have dictated. It was during this period that the banks sought to develop the current-account (kontokorrent) connections with firms that were eventually to dominate the banks' business activities and produce the idea of a "haus" bank. These banks reached the peak of their power at the turn of the century; it can be assumed that they exercised a great deal of influence on Schumpeter's thinking in the *Theory of Economic Development*.

Despite Schumpeter's optimistic view that the German Kreditbanks could support dynamic economic growth, there is some historical evidence that these industrial of "mixed" banks are more unstable than banking systems in which banks are "separated" or segregated as in the US after the 1930s depression. Examples are the difficulties faced by German industrial banks in the 1857 crisis, the Italian industrial banking collapse in the 1920s, and the difficulties of mixed banks throughout Europe in the 1930s as the value of their industrial holdings collapsed in the aftermath of the Credit Anstalt bankruptcy.

Nonetheless, mixed-bank systems, including that in Germany, survived this period of deep financial crisis in the inter-war period. How did these mixed banks manage to avoid the worst consequences of the price risks associated with financing their investments in long-term capital assets? Initially, German mixed banks took a bifurcated approach to financing the creation and subsequent activities of German firms, in response to German banking law (Kregel 1992c, 1995) and to regulatory changes imposed on German banks after the 1930s crisis.

How did this bifurcated system work? It was closely linked to the existence of an active stock market. For start-up companies, mixed banks' activities were very similar to that of venture capitalists in a segregated system (such as the US after the 1920s), seeking good new prospects and taking an active interest in their management until they could be floated on the stock market in an IPO. Then, once these start-up companies had taken off, the mixed-bank operated as "traders" for these companies, much the same role as US investment banks played in the US.

Behind this approach was German law, which does not restrict the types of business in which banks can engage, but places constraints on the composition of bank balance sheets. The most basic of these is the "*liquidity principle*," which limits long-term lending to the sum of a bank's long-term funding (defined as the bank's own equity plus sale of bank bonds), its long-term borrowing, 60% of its savings deposits, 10% of its current accounts, and its time deposits from non-financial entities. This means that German banks were required to match assets and liabilities within particular segments of the yield curve. Reduction in liquidity risk for banks holding long-term capital assets is achieved by imposed a rough matching of maturities in the long and short segments. So instead of segregating the financial system, German legislation segregated the individual bank's balance sheet into short and long term activities, with maturity matching in each section. This produces the logical equivalent of the separation of commercial and investment banks by imposing asset separation within any mixed bank's balance sheet.

This approach did not survive. In the German system of today, fixed-interest term lending has replaced venture capital type lending as was done by 19th-century Kreditbanks; and these banks' reliance on the equity market has all but disappeared. Why did institutional behavior change? One reason is that banks could never expand their equity fast enough to provide sufficient equity capital for even the emerging-firm portion of industrial-sector investment. To maintain the use pure equity finance, German banks would have had to convert themselves into either massive mutual investment funds or market makers in securities, rather than long-term lenders. A second reason is that the war and the currency reform had the effect of virtually wiping out the existing supply of government and private securities, eliminating the secondary capital market. Subsequently, new investment was financed primarily through retained earnings and short-term bank borrowing.

This situation sharply changed the operations of the large banks. These banks could not launch new firms by financing and underwriting the issue of these firms' share capital because there was no capital market on which to float shares. So the Schumpeterian activity of German banks effectively came to an end with the 1930s recession; the subsequent war made it impossible for them to recover their initial activities.

In the strengthening recovery after the war, the banks accumulated demand and time deposits, and rolled over short-term loans to firms into medium and long-term loans. By 1954, the ratio of short to medium-long lending was evenly split. Banks were thus faced with an ever-increasing maturity mismatch. This method of financing reconstruction, in the absence of capital markets, renewed the threat of banking instability, by generating the threat of liquidity crisis. Deposits could be withdrawn at any time; so in the event that short rates had to be increased rapidly to retain deposits while long term lending rates remained fixed, any change in yield differentials (such as might be caused by inflation) could lead to insolvency. There were a number of initiatives to revive the capital market, none of which had any impact.

Banks thus operated under risk of instability, due to the threat of inflation and of a deposit drain, which was especially significant for smaller banks. To meet the prudential regulations in this situation, banks issued long-term bonds, which were initially held within the financial sector. These fixed-interest liabilities matched the term lending of the banks to firms. Reliance on bond finance may thus be seen as a structural result of the way in which price risks are hedged in the German system, and as a substitute for the pre-war use of the equity market. The German mixed bank system is thus no less dependent on capital markets to reduce risk than are segmented bank systems; both require these markets as a means of providing a reduction in price risks. The difference is in the type of asset, bonds or equity, which dominates capital markets, and in whether the finance provided is direct or intermediated.

**7.2- The US Experience.**

The Schumpeterian banking function was accomplished very differently, in a bootstrap fashion, in the US. While the US Constitution forbid state governments the right to issue currency, they retained the authority to charter banks; many of them used this legal right to create banks that effectively functioned as state development agencies -- or what would now be called venture capital funds -- to raise finance for the development of state industry. "State legislatures resorted to the practice of granting banking privileges to railroad and canal companies, to gas and water works, to turnpike and power companies, and other similar enterprises to enable them to secure the necessary funds by issuing paper money" (Madeleine, pp. 66-7). These banks could be private or publicly owned, as in Kentucky. They could also have specific purposes. For example, the Union Bank of Louisiana was chartered as a "property bank" in April 1832; it sold bonds to residents of the Northern States and Europe. The proceeds were invested in real estate, which served as the security for the bonds. When state banks found it difficult to raise funds by selling their own liabilities they were aided by State governments who issued their own bonds and then turned the funds over to the banks or lent their bonds to the banks for resale. Thus, the States applied the Schumpeterian principle that they could finance their own development plans by creating banks playing the same role as Kreditbanks in Germany. These banks too experienced substantial instability over time, leading to an extended series of chartering reform efforts.

Since banks' spread position in a unified system can generate instability, a possible institutional reform suggests itself: limit commercial banks' operations to the short end of the yield curves for particular, low risk assets, then leave the rest of the curve to investment banks, whose investors – not risk-averse depositors – can take on the additional risk.13 Policy shifts would thus segregate the longer-term financing function of banks from their provision of safekeeping and transactions services, ensuring financial stability and the full financing of innovative competitive activity.

The only problem with this argument is that investment banks in the US have shown no revealed preference for risk and do not generally play the entire yield curve and spectrum of available assets. According to Morris (1999), US merchant banks such as J.P. Morgan, while important in financing railway development in the US and Germany, were far from the ideal of the Schumpeterian banker. Morris argues that Morgan was primarily interested in eliminating competition of all sorts, rather than financing innovation. He observes, "Rather than attempting to free entrepreneurs to pursue new applications of technological innovations, Morgan ... was attempting to *freeze* technology. None of the motley collection of tube, wire, bridge and other steel-product companies that he had merged into U.S. Steel were technologically advanced, and all had been under threat from Carnegie." (1999, p. 60) Over time, investment banks in the US have generally used their capital for short-term trading of new and existing capital assets in the longer segment of the yield curve forbidden to commercial banks. This experience and others suggests that investment banks in segregated systems have not assumed the Schumpeterian role of investment financing.[14]

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13 This remedy recalls the "real bills" doctrine, the Chicago proposals for 100% reserve banking advanced by Simons, von Hayek and Friedman, as well as recent proposals (Litan, 1987, Pierce, 1991) for "core" banks limited to investing depositor funds in government securities.

[14] For example, banks in the UK, though not subject to special regulations on their activities,

What investment banks in segregated systems *have* done, however, is to make capital markets more liquid. In so doing, they reduce the liquidity risk of holding long-term assets which is born in segregated systems by the final holders, the general public; by taking very short-term positions in long-term assets they are also able to avoid most of the price and interest rate risk associated with such assets. Investment banks in a segregated system tend to be traders, rather than risk-taking long-term investors. Thus, instead of providing long-term finance, these banks have rather organized liquid capital markets by intermediating between the long-term holders of assets and long-term borrowers. While they commit their own capital, borrowing, usually from commercial banks, finances the majority of their transactions.

In practice, then, the "separation" in such policy segregated systems is not between risk-averse commercial banks making short-term business loans and risk-loving investment banks committing their own capital long term, but between banks (both commercial banks as lenders to the investment banks and investment banks as dealers) acting as market makers, and households providing long-term investment finance and bearing price risk. The more efficient are banks in reducing liquidity risk, the more willing are households to accept price risks, and the more direct capital-market intermediation occurs through the financial markets.

For the economy as a whole, overall risks are spread over a larger base, as there are more households than investment banks. Since households are generally limited to lower leverage in financing their asset holdings than financial institutions, they are less likely to experience insolvency as a result of price risk. This suggests that the important characterizing feature of a financial system is the distribution of risks across types of banks and households, rather than whether finance is accomplished via the market or bank intermediation. The policy conclusion is then that intervention to separate banks' activities is not the decisive step in ensuring or undermining the provision of Schumpeterian finance.

### 7.3 -Policy Implications.

The comparison of German and US methods of imposing prudential segregation to achieve stability suggests that instead of referring generically to mixed (or universal) banks *versus* commercial banks, it would be more informative to refer to balance sheet segregation and functional segregation. The fact that neither investment banks nor mixed banks are willing or able to raise sufficient equity capital to provide equity finance for the industrial sector leads to long-term financing via public equity markets in the investment-banking case, and reliance on bond market finance in the mixed-bank case. So in terms of risk and instability, there seems to be little difference between the two forms of bank regulation.

This suggests that much policy discussion, contrasting the stability of segregated and mixed-bank regulatory structures, has been misplaced. From the point of view of Schumpeterian "creative destruction" or Minskyian "endogenous financial fragility" a certain amount of evolutionary instability is necessary to allow the competitive innovation that makes the system viable. When banks and other financial institutions provide the financial resources that lead to successful innovation by some firms, they will also be financing firms whose competitive

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behave as if they were subject to segregation, limiting their activity to short-term lending.

strategies are unsuccessful. Perfectly safe and stable banks would mean stagnant economic development. It thus seems clear that the major objective of policy cannot be the elimination of change and instability, for this would eliminate economic development. Rather, policy should be directed towards ensuring financing of innovative capital projects. Our historical comparison suggests that policy should not focus on the contrast between market and bank-based financial system, since even Schumpeter's "ideal" German Kreditbank was in fact fully integrated into the equity markets (before the war) and capital markets (after it).

The role of policy is prevent the endemic systemic instability that can cause reversals of capital flows and changes in financial prices (and lead to Minsky-Fisher debt deflations) by providing for appropriate integration of financial institutions and markets. This will involve several major areas. One is risk management. As seen above, the major activity of banks is risk management, not undertaking the risks of maturity mismatches. A second policy focus should be on monitoring the manner in which risks are shifted from financial institutions to other balance sheets, primarily those of the public. This puts emphasis on the provision of market liquidity. Households will be more willing to hold long-term assets if some of their price risk is offset by their ability to sell these assets at short notice in liquid markets. This liquidity, in turn, depends on the activity of financial institutions serving as market makers, either directly or indirectly. Their ability to make markets depends on their financing, in particular on their gearing or leverage ratios. In the near financial crash of August 1998, the excess leverage of a number of major financial institutions caused them to retrench, destroying market liquidity. This caused a collapse in asset prices bordering on a Minsky debt deflation, and caused the flow of new financing of competitive innovations by firms to dry up completely. In sum, policy must focus on risk management techniques of financial institutions, the manner in which this risk management shifts risks to balance sheets outside the financial sector, the provision of market liquidity, and the degree of leverage of balance sheets.

## 8 - Summary

In Minsky's view, capitalist economies have an inherent tendency to increasing leverage and financial vulnerability that leads sophisticated financial systems to be biased towards financial fragility. The competitive behavior of banks contributes to this momentum: banks tend to increase their lending to more highly leveraged companies linked to creative destruction and/or new technologies during periods of sustained economic expansion; but they drastically revise these companies' credit ratings, reducing lending and even calling in loans, as soon as they *suspect* that these debtors may face solvency problems.

From a dynamic Schumpeterian point of view, when banks are strategizing aggressively in a stable expansion they compete for market share by increasing the volume of their lending, especially to more aggressive innovators. This reinforces the process of endogenous change and inherent market instability, and increases lenders' exposure to risk. When banks strategize conservatively they compete for liquidity and/or solvency, which has the effect of worsening borrowers' balance sheet positions and increasing overall instability.

Both theorists thus describe how periods of sustained expansion and/or of the introduction of new technologies endogenously lead to the reduction of margins of safety and the generation of financial fragility – what Minsky (1986, introduction) described as *"destabilizing* *stability."* Competition in banking markets, especially in light of globalization, also endangers banks' performance of their Schumpeterian function of financing innovation and growth. This leads to the question of whether one or another approach to organizing banking activities can best guarantee that the financial system both facilitates growth and avoids (to the extent possible) instability. A review of German and US experience suggests that there is not. Both Germany and the US used policy to reach broadly similar results – that is, a financial structure that provided financing for growth and innovation – very differently, adapting their financial regulations on the basis of their respective industrial and financial-market structures, and of their different historical trajectories.

These two examples make it clear that the question is not so much whether more market allocation or less is more beneficial, but rather how to develop and support the financial system in a manner that ensures its participation in building up the knowledge-based activities that can assure greatest per capita income growth. Extending this example to developing nations, the lesson is that indigenous financial systems should be developed and defended in much the same way as nations have acted to develop and protect industrial "competitive" advantage. A good recent example is the German policy of Finanzplatz Deutschland (Kregel, 1998d, and Dore, 2000 part III; also see Chang (2002)). In an increasingly integrated and globalized economic environment, the challenges faced by countries seeking to better their lot will become ever more difficult and may require increased regional integration.

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