Evolving Technology and Market Structure

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Schumpeter: Finance and Evolution

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Introduction: The Vision

The themes of this essay are:

1. Financial entrepreneurship and, therefore, financial evolution are central to Schumpeter's vision of the process of economic development.
2. Schumpeter and Keynes are compatible, for they both defined the problem of economics as the analysis of a monetary production economy.
3. Innovations in financial relations since World War II validate this interpretation of Schumpeter's vision.
4. The economic theory that integrates Schumpeter and Keynes, which unifies what is usually called the real and the financial, improves our understanding of capitalist economies.

Schumpeter's central vision was set in his seminal *Theory of Economic Development,* whose first German edition was published in 1912, with a second revised edition in 1926. An English translation by Redvers Opie, with the full cooperation of Schumpeter, was published by Harvard University Press in 1934. This English edition and my selective memory are my main sources on Schumpeter's vision.

Our great ancestors, such as Schumpeter, are useful as they help us to understand the problems with which we struggle. There is no single true meaning of a seminal text, for such texts always breed interpretation, which reflects the light each reader brings to the text. Obviously each brings his own problems and perspectives. Thus what follows is a personal interpretation. As should be expected, I hold that the essential contribution of Schumpeter consists of a vision and an analytical framework that reinforce the validity of my prior positions on economic theory.

Schumpeter's central vision is of a fully integrated entrepreneurial monetary production economy in which the key profit-seeking activities lead to the development of new combinations. In his world, entrepreneurs and bankers (financiers) "know" that great profits can be earned only if market power is achieved and that successful innovation leads to market power. New combinations, which result from the outcomes of negotiations among entrepreneurial business men and financiers, lead to process and product innovations as well as new financing relations and new financial institutions. Those who finance a Schumpeterian innovator always have novel problems in structuring the financing.[1] Two sets of new combinations, in production and in finance, drive the evolution of the economy.

This central vision of economic evolution driven by innovating entrepreneurs remained with Schumpeter throughout his career. He never developed the power of abstraction that would have led to the construction of a precise model built upon this vision. Nevertheless the Schumpeter vision of dual financial and "real" entrepreneurial activity as the essential driving forces remains the foundation for the analysis of the evolution or development of capitalist economies. In Schumpeter's vision, economic development is not reduced to a by-product of technological development or even accumulation; development is always a social process.

Keynes's *General Theory* also reflects a vision of the capitalist economy as an integrated monetary-production system (Keynes 1936; Minsky 1975). Keynes was more precise analytically than Schumpeter. When the vision was formalized in terms of aggregate demand, broken into passive consumption and active investment components, the basis for an operational theory was set. It matters little whether the key relations are stated in terms of aggregate demand, as Keynes did, or of total profits (defined as gross capital income), as Kalecki (1965) did. The important step was the proposition that consumption, or equivalently saving, is passive, because it is determined by the past and present of the system, whereas investment is the active driving force, for it reflects present views of future outcomes.

A five-sided view of investment as:

1. a main determinant of aggregate demand,
2. the generator of production capacity,

1. If the innovation is internal to a modern multinational corporation, the shifting of funds from old to new business conforms to Schumpeter's vision of the banker's role in innovation as redeploying resources.

The structuring of financial commitments always implies that negotiations—an exchange of information and views—take place. The price theoretic foundations of an economy with banking, or more generally the external financing of activity, always need encompass the existence of private and therefore asymmetric information. See Akerlof (1970). For a bibliography on information and investment see Fazzari, Hubbard, Petersen 1988.

3. the source of increments to wealth,
4. the offset to liabilities, and
5. a determinant of the distribution of income

is common to a rounded view of Schumpeter and Keynes.

The standard modeling of Keynes, which may have been responsible for the initial success of Keynes's revolution and its current lack of stature among economic theorists, leads to an "equilibrium" identified with Hicks's IS-LM formulation (Hicks 1937). Because the IS-LM equilibrium is of markets for investment, saving, and finance, it is not the equilibrium of Walrasian theory, the stationary state, or Schumpeter's circular flow. Equilibrium-busting accumulation, increments to net worths, and portfolio choices are constantly taking place at an IS-LM equilibrium.

The IS-LM equilibrium implies ongoing changes or induced disequilibria in other markets: the equilibrium formulation of *The General Theory* is analytically a sibling of the Marshallian construction in terms of short- and long-run equilibrium (Marshall 1948).[2] To sustain the usefulness of the Keynesian system, the formal story of Keynes has to be fleshed out with a consideration of the evolving conditions that affect the determinants of the IS-LM equilibrium. An implicit evolutionary model underlies Keynesian theory.[3]

The history of Schumpeter's efforts to write a volume on money is, in good part, a story of Keynes figuratively trumping Schumpeter's aces (Tichy 1984). The visions of Schumpeter and Keynes are alike in that the subject of their work is a capitalist economy with complex financial structures. In terms of the vision of a monetary production economy Schumpeter clearly has

2. Writing of Wesley Clair Mitchell's 1913 *Business Cycles* and 1927 *Business Cycles: The Problem and the Setting*, Schumpeter noted that "there are only two fundamentally different groups of cycle theories. There is the 'theory' that the economic process is essentially non-oscillatory and that the explanation of cyclical as well as other fluctuations must therefore be sought in particular circumstances (monetary or other) which disturb that even flow. Marshall stands out in the large crowd that represents this 'hypothesis.' And there is the 'theory' that the economic process itself is essentially wave-like—that cycles are the form of capitalist evolution—the theory to which Mitchell was to lend the weight of his authority" (Schumpeter [1951] 1965, 252).

We may appreciate that Keynes had not fully shed the skin of the Marshallian comparative static approach to dynamic problems when he wrote *The General Theory*.

3. In the work of Mauro Galligoti and Dominico Dela Gatti the impact of the accumulation and financing that takes place in an IS-LM equilibrium is upon the positioning and the slope of the IS and LM relations. They derive an ingenious mechanism to explain the evolution of the economy from being stable to being unstable (Galligoti and Gatti, 1988).

precedence over Keynes. In terms of transforming the vision into a tractable model, Keynes won the day.

Both Keynes's and Schumpeter's schema are investment oriented, and investment in both involves a leap of faith into an uncertain future. Because of his work on probability, Keynes (1921) approached the development of a theory of an investing capitalist economy with a well worked out view of uncertainty.

Schumpeter and Keynes are best viewed as complements, not as substitutes. It is useful to integrate their work. In so doing we should reveal the power of Schumpeter's vision, fill in gaps left by the standard interpretations of Keynes, and hopefully make some progress in our main scientific concern, to understand the ways of capitalism.[4]

Schumpeter and Walras

Schumpeter was inconsistent. This is especially evident in his lavish praise of Walras. Walras's formal theory has evolved into the hyperstatic Arrow-Debreu general equilibrium theory (Arrow and Debreu 1954; Arrow and Hahn 1971). Frank Hahn has often noted the Arrow-Debreu theory can find no room for money (1981). Schumpeter would have understood Hahn's assertion of the irrelevance of money to static theory, for he wrote, in reference to the static circular flow model,

> Since the values and prices of money must be equal on the one hand to the values and prices of consumption goods and on the other hand to the values and prices of labor and land, it is clear that the essential lines of our picture (of the circular flow, hpm) are not altered by the insertion of intermediate links, that money only performs the function of a technical instrument, but adds nothing new to the phenomena. To employ a customary expression, we can say that money thus far represents only the cloak of economic things and nothing essential is overlooked in abstracting from it (Schumpeter 1934, 51).

4. The article on Wesley Clair Mitchell ([1951] 1965) was completed by Schumpeter only two weeks before his death on January 8, 1950. (Mitchell died on October 29, 1948.) This makes the comments on basic issues in economic theory in the article on Mitchell Schumpeter's last words on issues that concerned him throughout his career.

Writing of Mitchell's work on the American Greenback (fiat currency issued to partly finance the Civil War) experience Schumpeter wrote "he integrated the monetary phenomena with the rest, thus anticipating tendencies that have asserted themselves of late; and, on the other hand, he analyzed the relations that bind 'prices together in a system of responses through time' which led him quite naturally to the study of business cycles as a first step toward a general theory of the money economy of today, his real topic throughout his adult life" (249).

Later in this essay Schumpeter noted that "on the ground that the capitalist economy is a profit economy in which economic activity depends upon the factors which affect present or prospective pecuniary profits—equivalent to the Keynesian marginal efficiency of capital—which seems to tally . . . with the theories of a group of business cycle students that is almost as large as the group that looks upon cycles as inherent in the capitalist process."

Schumpeter was not lacking in ego. When he commends Mitchell—and incidentally Keynes—for their vision of an integrated money production economy where business cycles are inherent in the capitalist process because of the central role played by profits, he does so because their position is really his position.

Does Schumpeter's commendation of Mitchell and indirectly of Keynes mean that he died a closet Keynesian?

In the circular flow and in modern Walrasian theory, money is neutral; it is a veil.

In contrast to the Walrasian Arrow-Debreu view, Schumpeter's own theory and his vision of development were extraordinarily monetary. Development consists of new combinations, not mere accumulation, and "credit is primarily necessary to new combinations" (Schumpeter 1934, 70). New combinations require "the detaching of productive means (already employed somewhere) from the circular flow and allocating them to new combinations. This is done by credit, by means of which one who wishes to carry out new combinations outbids the producers in the circular flow in the market for the required means of production" (1934, 71). Therefore to understand development we must not overlook what "happens in the sphere of money and credit" (1934, 71). In Schumpeter's view of capitalist economies, money is never neutral and the credit mechanism as administered by banks and financiers is necessary for development.

In Schumpeter, development requires the redeployment of inherited capital, which banks mediate by redirecting the cash flows they receive as debts are repaid. In the process of redeploying financial assets, net accumulation is financed and profits result. This distribution theory is not a marginal productivity theory of distribution, it is a structure of demand theory. On distribution and on money Schumpeter cannot be fitted into today's neoclassical theory.

Innovations and entrepreneurship are not restricted to process and product in Schumpeter. Innovation and entrepreneurship are characteristics of capitalist finance. Because credit is essential to the process of development, a theory of economic development needs to integrate money into its basic formulation. Monetary factors cannot be added on after a prior or dominant model has determined the basic output and relative price variables. This essential aspect of Schumpeter's (and Keynes's) thought—that money and finance are there at the beginning—is inconsistent with Walrasian Theory.

The Centrality of Credit, i.e., Finance, in Schumpeter's Vision of Economic Development

In Schumpeter money emerges out of the credit system, it is always endogenous. But credit is the domain of the banker. To Schumpeter, "the banker, therefore is not so much primarily a middleman in the commodity, 'purchasing power,' as a *producer* of this commodity. He stands between those who wish to form new combinations and the possessor of productive means. He is essentially a phenomenon of development, though only when no central authority directs the social process. He makes possible the carrying out of new combinations, authorises people, in the name of society as it were, to form them. He is the ephor of the exchange economy" (1934, 74).

An ephor was an elected magistrate of Sparta who exercised supervisory power over the kings. The term refers to an overseer, guardian, or ruler. Note that the banker is the "ephor" only when "no central authority directs the social process." Development is a social process that may either be directed by a central authority or be the result of market interactions.

The sharp contrast that Schumpeter draws between a central authority and financial markets as the principal coordinating mechanism breaks down if economies with production-financial interrelations of the type he specified are even intermittently endogenously unstable and the instability has serious consequences. In this case, a central bank or some other central authority is needed that is able to intervene to contain the instability.

Central banking as we know it, though not as the fiscal agent of the state, emerged out of the exhibited instability of monetary production economies. A modern central bank that attempts to control aggregate demand and is the lender of last resort is the ephor of the ephor of the financial structure.[5]

Schumpeter's banker is not the safety first mortgage banker, immortalized in the "3–6–3" characterization of American Savings and Loan Organizations during the regulated era: These bankers paid 3% on deposit liabilities, charged 6% on mortgages, and were on the golf course by 3 P.M. Schumpeter's banker is a robber baron of J. P. Morgan's time. This Schumpeterian robber baron is not our own day's master of the corporate raid and the leveraged buy out, for Schumpeter's banker financed the creative part of creative destruction. Innovations in product and process, as well as in finance, flowed from the negotiations of bankers and businessmen, not mere financial restructuring.

Because of the complexities in structuring the financing of innovations,

5. The threat of international financial and economic instability has led to renewed calls for an international central bank. Such an institution would be an ephor to the third power: the ephor of the ephor of the ephor.

the interactions among the various markets are likely to lead to unstable relations: explosive business cycles rather than steady growth is likely to be the normal result of the financing process. Explosive business cycles undermine the conditions necessary for orderly investment and financing decisions and lead to periodic mass impoverization. An economy with explosive business cycles is dynamically inefficient. A developing monetary production economy requires devices that contain instabilities: central banking and big government emerged as mechanisms to contain instability. Even though Schumpeter might not approve, a favorable view of interventions aimed at containing explosive instability is implicit in his vision (Minsky 1986b).

Keynes

The essential compatibility of the vision of Schumpeter and Keynes is shown by their treatment of the behavior of bankers as leading to the endogenous determination of the money supply. Both visions give central roles to banker behavior in the determination of the way the economy functions; money is never separated from credit. However Keynes was much more precise in detailing the impact of bankers upon the economy.

The special insight of Keynes was the recognition that in a capitalist economy capital assets, collections of capital assets in production units, and a vast array of financial assets need to be priced. In a capitalist economy there is a price system for capital and financial assets as well as one for current output. In determining the prices of capital and financial assets money is special because its price is always one.[6]

Keynes had a quantity theory of money for asset prices: for any set of expected profit flows and preferences with respect to risk (i.e., the state of risk aversion or animal spirits) the price level of assets is determined by the supply of money. Output prices can be decomposed into costs, mainly of labor, and a markup. Markups as ex-post results reflect the composition of aggregate demand; as ex-ante offer prices, markups reflect market power. In *The General Theory,* Keynes developed a monetary theory of asset prices and a wage plus markup theory of output prices.

Competition among firms is for profits, but the aggregate of available profits is determined by the composition of demand. In the simplest case, made famous by Kalecki, aggregate gross capital income (profits) equals aggregate gross investment, and in Kalecki as in Keynes (and Schumpeter) the causality runs from investment to profits.

6. The exception to the price of a unit of money being one occurs in a bank money system when a banking unit goes bankrupt. In the United States prior to deposit insurance the price of part of the money supply would fall as banks failed.

If we add Keynes's theory of asset prices as a capitalization of expected profits, where the capitalization rate reflects portfolio opportunities, to the Schumpeter view that the function of banking is to determine the investment ideas that become investment projects, we are on our way to integrating Schumpeter and Keynes. Keynesian theory, centering around the pricing of assets, capital and financial, in an economy where profits exist because development is the normal state, offers just the analytical framework in which the power of Schumpeter's vision becomes evident.

The Keynesian theory of liquidity preference is commonly interpreted as a demand for money function. This interpretation, repudiated by Keynes in his rebuttal (1937a) to Viner (1936), was revived by Milton Friedman (1956) and became the analytical basis for the monetarist counterrevolution. In the rebuttal to Viner and in his contribution to Fisher's Festschrift (1937b), Keynes emphasized the two price levels character of capitalism.[7]

Keynes's theory requires that the price level of capital assets be determined in a different manner from the price level of current output: the two price levels need to be able to vary one from the other. This was accomplished by the monetary theory of capital asset prices, in which capital asset prices are "capitalizations of future profits" where the capitalizations take into account both the carrying costs and the ability to sell the assets (their liquidity). In Keynes's view $Pk/M = f(q,c,l)$, i.e., the price level of capital, given the quantity of money, M, is a function of the expected cash flows, q, the carrying costs, c, and the subjective value placed upon liquidity, l. Money, whose price is always 1, is valued as an asset solely because of its liquidity, i.e., $Pm/M = f(0,0,1) = 1$ for all M, although $dl/dm < 1$.[8] This two price level view of capitalism is similar to the Tobin Q view of investment (Tobin 1969).

Investment takes place when the capitalized value of expected profits exceeds the supply price of investment output by a margin that is sufficient to overcome the risk aversion of businessmen and financing is available for such projects. The availability of financing means that the banker's risk aversion is overcome. Future profits for innovative or entrepreneurial investment are highly conjectural. Earnings of capital assets that are similar to projected investments, which are available to guide investments that are similar to existing investments, are not available for innovative projects. In a closed economy, investment due to a wave of Schumpeterian innovation in products, processes, and finance increases gross capital income (a self-fulfilling prophecy), and the new deployments compete with the old for profits and presumably best them. Older capital assets lose value in an innovative economy.

7. One should not overlook Keynes's comment (1936) on Leontief's interpretation of *The General Theory* that was put forth in the same issue of the *QJE* as Viner's review. Keynes's rebuttal to his critics appeared as "The General Theory of Employment" (1937a).

8. Hyman P. Minsky (1975). This formulation implies that an increase in the quantity of money raises asset prices, and that the "power" of money to do so diminishes, at least in the short run: ultimately $dl/dm \rightarrow 0$.

A high state of animal spirits, which takes the form of optimistic projections of cash flows by both businessmen and bankers, is needed if innovative projects are to be undertaken. Inasmuch as financiers of innovation are aware of what I call Bill Janeway's first law, "Entrepreneurs lie," a systemic shortfall of cash flows below the optimistic expectations can lead to a sharp fall in animal spirits. Once finance and production are integrated, Keynes's animal spirits, i.e., the state of risk aversion, is endogenously determined by the behavior of the economy.

A further step in the integration of the two is taken once we recognize that Schumpeter's banker was essentially a merchant or investment banker, whereas Keynes's banker was more like an American commercial banker. A well-functioning and progressive capitalist economy needs both investment banking and commercial banking, both investment and positions in the stock of capital assets need to be financed.

As Jim Early has noted, Schumpeter defined the key concepts of capital and interest in monetary terms (Early 1987). This, too, is common to both Keynes and Schumpeter. A precept of the Keynesian and the Schumpeterian vision of the capitalist process is that propositions derived from "models" that abstract from money are not serious for economies with the monetary institutions that characterize capitalist economies.

The Centrality of Finance in a Keynesian Vision of the Instability of Capitalism

Keynes's *General Theory* was written in the aftermath of the great collapse of the American and world financial structure and while the Great Depression was exacting its toll. This was the era when Fisher was writing about the "Debt Deflation Theory of Great Depressions" (1933) and overindebtedness explanations of the Great Depression had considerable credence.[9]

The burden of private debts in the United States increased over the time of the great collapse, for individual measures, taken by units that tried to cut their debt, led, in the aggregate, to a situation where the incomes available for the validation of debt fell. Debts, financial commitments, and income flows belong in the explanation of why capitalist economies are prone to depressions (Caskey and Fazzari 1987). The extension of the Keynesian formalization to the analysis of business cycles requires an endogenous explanation of why

9. See, for example, Twentieth Century Fund (1938). Chaps. 1–7, The Factual Findings, were written by Albert G. Hart; Chap. 8, The Program, was by a "Committee on Debt Adjustment of the Twentieth Century Fund."

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portfolio preferences first allow for an increase of indebtedness relative to income and then change so that the desired debt income relation calls for the lowering of debt (Minsky 1957).

Institutional and usage innovations in finance accompany every period of prolonged expansion. These innovations usually relax financing constraints so that the pace of investment increases when any differential between the price level of capital assets and the price level of investment output exists. Institutional innovations in finance, during extended periods of economic expansion, lead to systemic increases in the dependence upon outside finance and debt leveraging for both investing and holding capital assets. The increase in leverage increases investment, aggregate demand, and profits.

A potentially explosive expansion follows from this "self-fulfilling prophecy," as the belief that future profits will be "good" leads to the financing of investment that assures that current profits are better than expected. Economies with financial innovations that are driven by market prospects are structurally conducive to booms and busts: they are conducive to debt structures that increase the prior commitments of cash flows due to debt at a faster pace than investment increases productive capacity. A shift of the distribution of capital income toward rentiers during a prolonged expansion seems to be endogenous in an economy where financial innovation responds to profit opportunities. Such a shift will tend to reduce entrepreneurial incomes, leading to a decrease in investment, and, unless offset by other profit inducing spending, in aggregate capital income.

A slowdown in the rate of increase of the external financing of investment, a rise in financing costs, or even a crisis of an outrider in debt financing can lead to a sharp increase in banker and businessman risk aversion, inducing a desire to unwind some debt financing. A boom associated with financial innovations is likely to carry the seeds of its own destruction: the fruit of these seeds being a wave of bankruptcies that can lead to a debt deflation process unless contained by apt interventions. Central banking and big government, as they have evolved in the post–World War II world, are just such institutions of intervention.

Entrepreneurial Finance and Economic Evolution

The standard emphasis in the discussion of entrepreneurs is upon new combinations in production or new products. This naturally leads to a production function conceptualization of development, where the relation between inputs and outputs changes. Conceptually, but apparently not in fact, such entrepreneurship and change could take place in a socialist economy.

In a capitalist environment we have another dimension to entrepreneurship, change and evolution. There are financial entrepreneurs: financial institutions and usages appear and disappear. 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 essentially integrated character of Schumpeter's vision.

In the standard view of Schumpeter's vision, the driving force and the initiative in the banker-businessman negotiations come from entrepreneurial businesses. But in a capitalist economy the drive to innovate is universal: bankers can also be entrepreneurs. New types of financing possibilities can trigger process and product innovation, even as the evolution of financial relations and structures can erect barriers to development.

In our own time the huge external debts of countries like Argentina, Mexico, and Brazil serve as barriers to development. It can be conjectured that the massive takeover and leveraged buyout activity of recent years may retard U.S. development, although the burden of debt and the greater management ownership that result from this activity may concentrate managerial minds.

Financial change and evolution have been marked characteristics of the post World War II era. A thorough analysis of the dynamics of financial change is beyond the scope of this short paper. I will examine some of the main evolutionary changes in the U.S. financial structure and the lessons that experience teaches for the regulation of banking in particular and business in general.

The broad picture is that, at the end of World War II, the financial structure of the United States was characterized by an extraordinary low level of private debt: businesses, households, and state and municipal governments had minimum levels of debt, especially in the light of the postwar wage levels and profits. These low private debt levels were the result of the risk aversion induced by the Great Depression and the huge deficits of the government during World War II. The reverse side of the coin of government deficits was that households and businesses acquired huge amounts of liquid assets—government debt and bank deposits. In turn, bank assets were largely government debt. There was a fear that the depression would resume after the war, so that the avoidance of debt and the maintenance of liquidity had high priorities in decision making by businesses, households, and banks during the late 1940s and early 1950s.

Nevertheless many units believed that they were excessively liquid. As such units used their liquid assets to finance consumption and investment spending, profits and worker incomes were higher than anticipated. (In terms of the simplistic quantity theory, the expansion was largely financed by velocity-

increasing portfolio changes.) As a result of these attempts to use liquid assets to finance spending, household income and corporation profits were greater than anticipated. Such unanticipated incomes led to the acquisition of liquid assets. The desired erosion of the liquid asset position of households and businesses took place slowly. The weight of government debt in bank portfolios remained high even as business and other financial sectors, such as insurance companies, succeeded in diversifying their portfolios, i.e., in reducing the ratio of government debts in their portfolios (Friedman 1986; Minsky 1972, 1980).

Over the first decade of the postwar period, the heavy weight of government debt in bank portfolios meant that trading in government securities was the principal vehicle for bank reserve adjustments: transactions in government debt (mainly Treasury Bills) were used to bring actual bank reserves to their desired position. This early postwar model of bank position making involved dealing in a bank asset, Treasury Bills. Special relations developed between the Federal Reserve, money market banks, and the dealers in Treasury Bills that guaranteed that dealers could finance whatever holdings of Treasury debt the market thrust upon them. In this institutional arrangement, asset management was the method banks and other financial organizations used to make their position.

Only in the mid 1950s did some leading banks run out of holdings of Treasury debt that could be used for position making. When this happened, a market—the Federal Funds Market—developed in the reserves of banks on deposit at the Federal Reserve. The growth of the Federal Funds Market after the mid-1950s was a response to profit opportunities. It provides clear evidence of the endogeny of bank financing capacity (Minsky 1957).

The Federal Funds market deals in a bank liability, borrowed Federal Funds. With the full development of the Federal Funds market such that all banks (as well as other institutions) participated, a broad shift from asset to liability management of position making took place. Once position making through borrowing was accepted, other forms of borrowing for position making developed, such as large denomination certificates of deposit, bank holding company commercial paper, Eurodollar deposits, and various forms of repurchase agreements. Liability management banking can now be interpreted as a step toward a securitized financial structure.

Over the 1960s and 1970s banks, other financial institutions, and any organization that held or needed large stocks of quick funds developed a wide array of instruments and usages that enabled them to "buy money" by issuing certificates of deposit, holding company commercial paper, or engaging in repurchase agreements. The linkage for banks between a deposit or customer base and the ability to finance portfolios became tenuous.

The ability to finance activity was increasingly divorced from the High Powered Money that the Federal Reserve made available. Well before Chairman Paul Volcker adopted practical monetarism as the guiding rule for the Federal Reserve, the institutional structure compatible with an emphasis upon a money supply rule was eroded (Greider 1987; Minsky 1988).

The 1979–82 experiment in practical monetarism was doomed from the start, for it was based upon a misspecification of how advanced capitalist economies operate. It did mischief as the interest rates that developed under the rule of monetarism led to the capitalization of interest (Ponzi finance) for entities as diverse as Savings and Loan Associations, Mexico, Brazil, and nuclear power plants under construction. The interest rates that developed under the myopic money supply rule attracted funds to the United States from abroad, which led to an unwarranted rise in the exchange value of the dollar, which led to a flood of imports and the deterioration of U.S. industry. Furthermore interest rates as costs exacerbated inflation before imports, unemployment, and union busting induced disinflation. The lesson from the experiment with practical monetarism is that in a financially linked world a major player cannot constrain its banking system so that extraordinarily high interest rates become the rule without inducing serious side effects that may more than offset any welfare gains that the money supply rule may bring.

The financial "industries" have been remarkably fecund in developing new instruments, institutions, and usages over the past thirty years. In part, this evolutionary process was driven by profit potentials that opened as communication and computing capabilities grew and as business, financiers, and portfolio managers learned the financial impact of the changes that had been brought about by the revolution of government intervention in the aftermath of the Great Depression and the development of the postwar welfare states.

The evolution of the financial structure as the postwar era progressed was also a response to the obsolescence of regulatory arrangements that had been put in place prior to World War II. The regulatory structure assumed a downside vulnerability to the primary income-determined cash flows—wages, gross profits, and tax revenues—that no longer ruled. This change in behavior reflected changes in structure. The government budget after World War II constituted a much larger proportion of full employment GNP than it had prior to the Great Depression. This assured that large deficits would appear whenever investment seemed about to fall, which would sustain business cash flows (profits). Furthermore, as was shown in the various financial disturbances, the various Central Banks were much readier to intervene to assure that asset prices did not collapse.

In the inflationary period of the 1970s the interest rate differential between market instrument yields and what the regulated and insured deposit institutions were allowed to pay increased. This interest rate pattern opened profit opportunities for money market funds that financed portfolios of marketable securities by "shares" that were claims upon the portfolio: these

shares were enhanced over the quality of the assets in their portfolios only by the presumed professionalism of the portfolio manager.

The innovation of money market funds with well nigh demand liabilities during the inflation of the 1970s was a critical step in the growth of the importance of markets as compared to institutions in finance. It demonstrated the ability of noninstitutionalized funds to raise money. The logical extension of the money market fund was to develop funds with other types of assets in their portfolio. Furthermore, such funds were available to modest investors, domestic and foreign, as well as to institutional investors. The money market funds and the innovative extensions that followed facilitated the internationalization of finance.

In May, 1987, the buzzwords at the annual Banking Structure and Competition conference of the Federal Reserve Bank of Chicago were: "That which can be securitized, will be securitized." This meant that financial markets would henceforth be central to the financing of activity and positions and that the role of depository institutions would be greatly curtailed. The stock market crash of October, 1987, adversely affected the brokerage houses that play a main role in securitization, slowing down the progress of this "revolution" in finance.

Securitization involves the creation of a portfolio, a corpus of assets, that becomes the underlying asset for some complex of financial instruments that are sold on the market. The revolutionary feature of the securitization process is the creation of various classes of claims or interests in the underlying portfolio: these claims falling into a hierarchical pattern even unto the creation of ersatz equity in the form of debts that are residual claimants to the cash flows. In a securitization deal the essential players are: (1) debtors, (2) a paper creator (a Savings and Loan Association, if the instrument is a mortgage), and (3) an investment banker, who (*a*) creates the portfolio, (*b*) buys the paper (bridge financing), (*c*) creates the liabilities, which involves enhancing the credits (successful securitization requires that the investment banker sell the portfolio's liabilities at a substantial premium over what the portfolio cost), (*d*) sells the liabilities, and (*e*) selects a trustee to act in the interests of the liability owners and the "ultimate" holder of the liabilities of the trust, which may be some institutional investor.

In order for a securitization deal to be profitable for the investment banker and the other financial institutions, the complex of liabilities must pay out substantially less than the underlying assets earn; i.e., they must be sold for more than the cost of the underlying assets. This is achieved by having a position in assets that earn substantially more than the lowest market rates and creating liabilities that can be sold to yield the lowest market rates. The enhancing of credit by means of structured liabilities is a substitute for the enhancing of credit that bank capital provides. Securitization obviously is a way to carry on the financing of activity when the underlying equity of financial institutions has been compromised. However, securitization involves a transfer of risk from the investors in bank stocks to the holders of the credit-enhancing subsidiary claims on the corpus of the trust (Minsky 1986a).

Securitization makes the steps in financing explicit. It allows separate organizations to carry out the steps that were previously included in the activities of banks and other financial intermediaries. Securitization will obviously impose a dynamic on financing that may well lead to greater decentralization and a greater variety of forms of financing than now exist. It may also decrease the threat of a financial collapse, for the institutional fragility that was critical in the blossoming of a debt deflation is replaced with a failure of particular instruments to perform. As long as the aggregate cash flows available to satisfy the commitments on financial instruments do not collapse, i.e., aggregate profits are sustained by government deficits whenever investment tends to decrease, excesses in financial markets are likely to lead to rolling economic and financial adjustments rather than to the general collapse of asset values and economic activity that characterizes a debt deflation.

The Stages of Capitalist Financial Development

It is a great simplification to formulate how the interrelated markets of a capitalist economy interact in terms of stages of development: this simplification is meaningful only as it yields relevant propositions.

A practical problem of public policy and private decision making is to explain why the capitalist economies avoided a global depression in the 1970s and 1980s even though the adjustments in some industries, countries, and financial markets have been very serious. To a representative Mexican, the drop in per capita real GNP between 1982 and 1988 has been as great as in the Great Depression. A hard-nosed reading in 1988 of the cash flows to the Savings and Loan Associations in the United States shows that without the government guarantee of savings institution liabilities, the bankruptcy rate would exceed that of the Great Depression: these depository institutions are able to function and their liabilities remain at par because of an implicit full faith and credit commitment of the Federal government. The stock market crash of October 19 and 20, 1987, was absorbed with little or no effect upon income, employment, and aggregate business profits.

A Schumpeterian insight to this problem of differences in behavior between the pre– and post–World War II capitalist economies is that the economies are not the same: capitalism is resilient because it takes many particular forms. In one sense this is trivial; big government and active central banking have contained the endogenous dynamic processes that, from time to time,

made the market system behave in an incoherent fashion. In another sense it is not trivial, for the endogenous evolutionary dynamics of capitalist economies change the relations between financial and real economic variables which, in turn, changes the dynamic patterns of the economy.

Any discussion of a monetary production economy, that is, an economy consistent with the shared vision of Schumpeter and Keynes (and Mitchell) must begin with the propositions that only that which is financed can happen and that there are two basic sources of financing:

1. cash flows from contributions to income, which includes the money flows on financial instruments that are derived from income flows, and
2. cash flows from borrowing, new issues of equities, and the sale of assets.

The ability to borrow (sell loans), sell equities, or sell capital assets depends upon the belief of the buyer of financial instruments that these pieces of paper will yield cash flows that are linked to payments resulting from contributions to the creation of future income. Yesterday, today, and tomorrow exist and are linked through financial as well as technical production relations.

The Financing of Trade and Industry

Four distinct regimes can be identified in the relations between finance and business. These regimes are distinguished by differences between trade and industry, capital intensity as measured by the production costs of capital assets of typical enterprises, and the balance of economic power between merchants and managers, on one side, and financing institutions and financial market operators, on the other.

Commercial Capitalism

In the pure model of commercial capitalism only trade is financed by the banking system and organized financial markets. Commercial capitalism is an outgrowth from merchants placing their goods on ships and caravans (note Antonio's description of his trade ventures in *The Merchant of Venice*). Once goods are shipped to order from a merchant in one place to a merchant in another place at some distance, guarantees of the probity and worthiness of the traders need to be exchanged. Bankers are specialists in knowing their own community and in knowing bankers in other communities. Trade at a distance, and therefore payments at a distance, requires a need for both knowledge about merchants at a distant place (even unto the shores of Bohemia) and the financing of goods in transit.

The banking of commercial capitalism, merchant banking, involves both the vouching for the legitimacy of distant trade partners and the financing of goods in transit. The emergence of profits to the trading partners in an economy with such trade really centers around the volume of goods in stocks (inventories) and in transit, although an economy with a favorable balance of trade will capture a disproportionate share of profits from the global total. The mercantilist view of the importance of a favorable balance of trade emerges from the positive impact a trade surplus has upon profits. Policymakers in advanced capitalist economies who recognize the importance of a favorable balance of trade will engage in "beggar my neighbor" practices.

In the pure commercial capitalism regime, the financing of expensive and long-lived capital assets falls outside the domain of the banks and organized financial markets. Proprietorships, partnerships, and governments provide the funds for the capital assets of such an economy. Pure commercial capitalism did not survive the introduction of capital-intensive transportation, modern utilities, or factory manufacturing. Raw material export economies were typically characterized by banking structures that specialized in commercial credit; such banking structures are ill-suited for financing the capital development of their economy.

In commercial capitalism, private economic power is fragmented and dispersed. Often the state has had to participate in mobilizing resources for major investment projects. Many of the agricultural export economies of today are characterized by financial structures that are not well suited to the mobilization of resources for the private decentralized development of a modern production structure.

Finance Capitalism

The great period of capitalist development after the French and American Revolutions was characterized by the emergence of financial organizations that could mobilize vast resources for projects such as railroads, utilities, mills, and mines. The financing either took place within banks (the German universal banking structures) or through markets (the British and American structures) which led to the emergence of independent investment bankers. In both cases the banking structures became the centers of economic power. This was the era of the houses of Rothschild and Morgan.

In the century between Waterloo and World War I, finance capitalism became dominant. This century was characterized by the exploitation of positions of financial power for personal economic aggrandizement, a great sweep of economic expansion and betterment, and recurrent economic crises and depressions which, for many, effectively undid whatever economic betterment was achieved in good times. The business cycle became as marked a feature of economic life as progress. Explaining the business cycle became the domi-

nant problem of economics, and the favored explanation became the argument that a monetary production economy, to use Keynes's phrase, behaved so as to cause business cycles. After World War I, finance capitalism had a final flowering. Finance capitalism suffered a serious blow in the Great Depression, and the impact of war finance on corporations compounded the effects of the depression (Schumpeter [1951] 1965, chap. 9).

Managerial Capitalism

The economy that emerged out of the Great Depression and World War II involved four features:

1. a government that was responsible for a substantially larger portion of GNP than had been true in earlier epochs,
2. a welfare state with substantial transfer payments and income in kind,
3. an initially robust financial structure, and
4. as the financial structure became fragile, broad central bank interventions that prevented a collapse in dollar asset values.

Furthermore, as result of huge government deficits and direct controls upon household and business spending during the war, businesses, households, and financial institutions were liquid. Business debts were far lower than they had been and business was a net holder of financial assets. Households had saved a great deal during the war in the form of financial instruments and their debts to finance automobiles and housing were very low, in particular compared to household incomes. The assets of banks and other financial institutions were heavily weighted by government debts: commercial bank lending to business was a proportionately smaller part of their business than hitherto. A financial structure with these characteristics is robust (Friedman 1986; Minsky 1972).

In this situation the managers of corporations were more independent of the commercial and investment banking communities than hitherto. The finance capitalism model of banker dominance of capitalist development was not relevant. As long as the flow of dividends was sustained, corporate management was largely independent of stockholder control. In this structure, corporate management, legally an agent of the stockholders, was the dominant actor.

Corporate managements, controlling large cash flows, had freedom to pursue alternative, even inconsistent, goals. They were able to pursue long-range objectives, be "socially" responsible, enjoy the easy life of a monopolist, and build conglomerate organizations. They were also able to use corporate funds to finance management prerogatives.

This structure had obvious internal inconsistencies. It relied upon restricted competition and generally accepted rules of the game. The growth of international competition as well as the feedbacks from success in the form of the development of sterile bureaucracies made managerial capitalism vulnerable to organizational and financial innovators.

Managed Money Capitalism

In the postwar era, managed money capitalism, a new form, was born out of the success of managerial capitalism. Managerial capitalism did not exhibit the serious recessions and depressions of finance capitalism. In particular, no debt deflations of the kind described by Irving Fisher took place: this meant that nominal values of wealth never collapsed and no depression-induced dissavings took place. Whereas cyclically prone finance capitalism had periods during which serious generalized impoverishments occurred, no such periods occurred in the postwar period when the combination of managerial capitalism and the welfare state ruled. The absence of generalized depressions was a good side effect of the successful welfare state.

One aspect of the welfare state in the United States was that state supported old age pensions (Social Security) were supplemented with private pensions. These private pensions led to vast accumulations of funds. Trust departments of banks, insurance companies, and specialized organizations of various kinds vied for the management of these funds. Over the years, as a result of various scandals, laws and regulations were developed as guidelines for the management of these funds. Nevertheless, considerable discretion remained with the fund managers, and they used this discretion to try to maximize returns. Funds migrated to the successful fund managers.

Inflation plays havoc with the value of deposits. Savings accounts with controlled interest rates were poor investments over the period when inflation ran in the double digits. After enduring the inflation damage, personal accumulations migrated to mutual and money market funds and annuities, i.e., managed portfolios, in which individual investors owned interests in a corpus of financial assets. The growth of mutual and money market funds added to the amount of managed money.

The result of the growth of pension funds, mutual funds, bank trust funds, and endowments of private institutions is that a large portion of the outstanding shares of major corporations is now owned by these large institutional holders, who actively manage their funds with the objective of maximizing the total portfolio return over each short period.[10] Active management implies that the holdings in a portfolio are always "in the market." These funds do not buy and hold common stocks for the longer term increases in dividend income; the annualized rate of return from catching a short run

10. The struggle between the management of Texico and Carl Icahn for control of Texico brought some of the dimensions of managed money capitalism to the fore. At the time of the proxy vote some 243 million shares of Texico common stock were outstanding. Icahn owned 14.8 percent, major institutions 38.3 percent, arbitragers 6.2 percent, and Texico employees, directors,

swing in interest rates or in stock prices can easily dominate interest or dividend income.

Billion dollar funds do not own 100 shares of a $30 stock; their position in any particular share will be measured in the millions of dollars. As a result they cannot sell or buy their holdings in the same way that households of ordinary wealth take or dispose of a position. The growth of the institutional funds meant that "block trading" developed. In block trading, an investment bank will buy for its own account, or will accumulate over time, a position in a security that a money manager either seeks to dispose of or seeks to accumulate. Block traders will take a position when a customer seeks to sell, usually at a discount from the market, and then either find some other fund that is willing to buy the security or dispose of the security in smaller lots over time.

The orderly functioning of a stock market with large funds of managed money requires that the block traders be willing and able to take positions. This requires that adequate financing be available from the money market banks for the block traders. In the international stock market crash of October 19 and 20, 1987, such position-taking by the block traders and financing by the great banks disappeared. It took serious interventions and, presumably, guarantees by the Federal Reserve to sustain the stock market on October 20, 1987.[11]

A second aspect of managed money capitalism is that these funds, presumably managed for the benefit of some future pension receiver or annuitant, need to accept "good offers" for their holdings if such offers are made. This means that takeovers (friendly and unfriendly) and financial restructuring, such as leveraged buyouts, are facilitated. Managed monies that are willing to sell their shares to leveraged buyouts are also the buyers of junk bonds issued to finance such reorganizations.[12]

Managed money capitalism has diminished the financial independence of corporate management. Managed money capitalism is part of the trend toward an increase in the proportion of financing that takes place through markets rather than through intermediaries. The large money market banks are important in financing the positions of block traders and in bridge-financing takeovers and leveraged buyouts (financing the deal in the interval between the accepted offer and the issuance of junk bonds). Even so, the

and officers 6.0 percent. Individual owners owned only some 20.0 percent (*New York Times*, June 18, 1988).

Among the major institutions, J. P. Morgan Investment Management held over 5 million shares, College Retirement Equity Fund held some 3.9 million shares. At the price that ruled on June 17, the shares held by Morgan were worth about a quarter billion dollars (*Wall Street Journal*, June, 17, 1988).

11. The *Wall Street Journal*, November 19, 1987, gave an account of the events.

12. The "funds" that sell the shares to a leveraged buyout are not necessarily the funds that buy the junk bonds.

1950s and 1960s pattern of continuing bank and bank borrower relations is now obsolete.

Management could take technological risks under managerial capitalism. To take a failed case, as an example, RCA developed and tried to promote a laser disc system of home video. The capitalism of managed money emphasizes cash flows in the near near-term to support stock prices and heavily indebted liability structures. Whereas the diminished role of institutions may have decreased the likelihood of debt deflation, the growth of heavy indebtedness may well restrain the overall propensity to innovate or to take chances.

Any major decline in the aggregate gross capital income could lead to a serious breakdown in the ability of managers of money to deliver the promised cash to their clients. Panic-like attempts to cash in mutual funds became evident on October 20, 1987. Money manager capitalism may be more vulnerable to shortfalls of gross profits than the lightly indebted managerial capitalism. More than ever, the profit sustaining effect of government expenditures that are substantial proportions of GNP together with prompt Federal Reserve intervention is required for aggregate stability (Giordano 1987).

Money managers are a large part of the market for securitized instruments. Sophisticated instruments can be created that mete out the cash flow from a corpus of assets with given cash flow properties to various claimants—the essence of securitization—in a way that is tailor-made to suit the objectives of particular funds.

Securitization is international. As an example, United States real estate–based instruments are found in the portfolios of Japanese insurance companies. Inasmuch as private supplementary pensions are becoming an international phenomena, we can expect a growth of managed money capitalism outside the United States. As managed funds grow, we should expect a world in which international portfolio diversification is much more prevalent than it has been to date. There is a symbiotic relation between the growth of securitization and of managed money.

Managed money capitalism is international in both the funds and the assets in the funds. It has rendered obsolete the view that trade patterns determine the short-run movement of exchange rates. Although it may be less susceptible to debt deflations than financial capitalism, it is more dependent upon the sustained flow of profits and other incomes that validate debt than the low indebtedness managerial capitalism. As the countries that are involved in managed money capitalism increase, an international division of responsibility for maintaining global aggregate gross profits will be necessary.

The Mixture: Changing Weights

All of the financial industry and financial trade relations identified above coexist in today's advanced economies. Policy-making and even individual

decision making that assumes that the world is a pure this or that is likely to be counterproductive. Nevertheless, it is readily obvious that the growth of managed money is having profound impacts upon the performance and the power relations within capitalist economies.

How technological dynamism is to be sustained in a world where the natural risk aversion of businessmen and financiers is amplified by liability structures that pledge a major part of cash flows is a question that the growth of managed money capitalism opens. Whereas venture capital funds may do the job for smaller innovative efforts, when the capital needs of advanced technology require financial investments that, in effect, bet a highly leveraged company, the investment decision is likely to be passed over. One paradox that emerges from the growth of managed money capitalism is that the financing of truly innovative technologies and products may become a state responsibility. Capitalism may require intervention to remain technologically dynamic in an era of managed money capitalism.

Conclusion

Schumpeter's vision of capitalism as an ever-evolving structure, where the evolution is driven by profit-seeking innovators, is amply born out by the changes that have occurred over the past half-century, let alone 200 years, in the fundamental relations between business and finance. The Schumpeter vision of the dynamic interplay between finance and business that made the generic banker the ephor of the market economy has never been reduced to a simple formalization as Hicks and Hansen reduced Keynes. Nevertheless when one digs deeper into Keynes, and emphasizes Keynes's analysis of the price level of capital assets, then Keynes and Schumpeter (and Mitchell) become compatible parts of the quest for a unified price and monetary theory.

The message of Schumpeter for our times is that market-oriented economic development requires two analytically distinct sets of entrepreneurs: the innovators in product and process and the innovators in finance. Furthermore, the instability of capitalist development—the flaw in capitalism—arises because this two-sided innovative process is fundamentally unstable: intermittent incoherence, not the perpetual coherence of the Walrasian schema, is the normal outcome of capitalist development. Although Schumpeter found great virtues in capitalism, he cannot be reduced to an apologist for capitalism.

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Part 2
The Theory of Invention and Innovation