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The Financial-Instability Hypothesis: Capitalist Processes and the Behavior of the Economy

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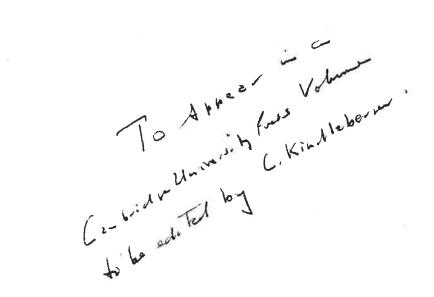Follow this and additional works at: https://digitalcommons.bard.edu/hm_archive

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2. The financial-instability hypothesis: capitalist processes and the behavior of the economy

HYMAN P. MINSKY

1. Introduction

Financial instability and crises are facts of economic life. Precise definitions are not necessary, for the major episodes of instability, whether runaway inflation, a speculative bubble, an exchange crisis, or debt deflation, can be identified by pointing (Kindleberger, 1978). Analytically, financial instability can be defined as a process in which rapid and accelerating changes in the prices of assets (both financial and capital) take place relative to the prices of current output. Of particular importance for this chapter is the relationship between financial instability and the deep depressions of history. On the debt-deflation side of financial instability, which is a major focus of what follows (although the theory is symmetrical with respect to inflations and deflations), the critical element in explaining why financial instability occurs is the development over historical time of liability structures that cannot be validated by market-determined cash flows or asset values. Thus in a free market, wide and spreading bankruptcies can occur, but in an economy with big government and an alert lender of last resort, the thrust to debt deflation can be overridden. One of the implications of the theory that is labeled the financial-instability hypothesis is that there are "costs" to overriding the thrust to debt deflation in the form of an aggravated instability and a tendency toward stagflation.

Financial instability is a nonevent, something that just cannot happen, insofar as the standard body of today's economic theory is concerned. If economic theory were just as abstract game played by some who were moderately gifted in mathematics, such ignoring of observed reality would be only a minor nuisance. However, each era's standard theory is the guide to the era's economic policy. The floundering of the capitalist economies in the 1970s reflects the irrelevance of the theoretical framework that the economists of the policy establishments apply when they advise and instruct political leaders. In part, the malaise of capitalist countries is iatrogenic – the disease has been induced in the patient by physicians.

Standard theory will not do because it ignores essential facts and cannot

explain important observations. Therefore there is a need to replace standard theory. Fortunately we do not have to start such a reconstruction of theory from square zero. Before theory became a victim of mathematics and observations were replaced by ~ntouts, economists recognized that financial crises occurred and set their minds to explaining why they took place and their effects on system performance.[1]

There are interpretations of *The General Theory* (Keynes, 1936) that differ from the interpretation in the standard literature (Chick, 1973; Davidson. 1972; Keynes, 1937; Kregel. 1973; Minsky, 1975a; Robinson, 1971; Weintraub. 1966). One implication of these interpretations is that *The General Theory* points to. even if it does not fully realize, an economic theory that is relevant for a capitalist economy because it fully integrates the behavior of what standard literature labels the real economy with the financial system. One implication of these interpretations is that the processes of a capitalist economy that finance investment and asset holdings lead to the endogenous development of conditions conducive to a financial crisis. This means that Keynes provides us with the shoulders of a giant on which we can stand as we try to understand how capitalist economies behave.

II. The financial-instability hypothesis in relation to standard theory

During recent years there has been a discussion as to the "true meaning" of Keynes. My contribution is a little book in the Columbia essays on the great economists. In that book I hold "that *The General Theory* does embody a revolutionary change in economic theory. but that in the process of arriving at today's standard version of ,what Keynes was about the revolution was aborted" (Minsky, 1975a). I argued that "the missing step in the standard Keynesian theory was the explicit consideration of capitalist finance within a cyclical and speculative context. Once capitalist finance is introduced and the development of cash flows (as stated in the interrelated balance sheets) during the various states of the economy [is] explicitly examined, then the full power of the revolutionary insights and the alternative frame of analysis that Keynes developed becomes evident" (Minsky, 1975a:129). The events since the book was written bear out the virtue of looking at capitalist economies from the perspective of their financial relations.

Standard interpretations of Keynes virtually ignore his analysis of financial markets and interrelationships. They are strangely ahistorical. It is not necessary that one wholeheartedly embrace the view that anomalies are the driving force behind scientific revolutions (Kuhn, 1962) to recognize that the collapse of the American and world financial systems between 1929 and 1933 was a powerful factor tending to concentrate the mind of anyone who

was trying during those years to explain the behavior of capitalist economies. The impact of the financial collapse on the formation of a new theory would be especially marked if the principal adventurer in the quest for new understanding was a political animal who was deeply involved both in the "city" and along corridors of power. In order to understand *The General Theory* we need to recognize that the financial collapse of 1929–33 was recent history when *The General Theory* was being formulated. It is necessary to believe that Keynes understood and appreciated the interactive process that Irving Fisher described so well (Fisher, 1933).

Those who describe Keynes as mainly concerned with labor-market disequilibria in which real wages are "too high" seem unaware that persistence of unemployment was not the critical problem when *The General Theory* was formulated. The critical problem was that unemployment kept increasing even though money wages and prices were falling rapidly. If unemployment equilibrium occurred, it was only after the downward plunge was halted in 1933; until then the critical labor-market development was the unprecedented increase in unemployment.

The disequilibrium interpretation of Keynes (Malinvaud, 1977) holds that unemployment results from a combination of market functions and constraints that lead to a rationing of jobs among workers. Fixed-price sellers. inflexible money wages. and a floor to interest rates are some of the forms disequilibrium-inducing constraints can take. This constrained-equilibrium approach to macroeconomics ignores the problem of the functioning of a system in which various facets of today's behavior are determined by variables that reflect quite different time horizons.

Keynes divided the economic problem of a capitalist economy into a primary problem. the determination of various budget constraints, and a secondary problem. the determination of individual outputs. Once the primary problem is solved. the secondary problem can be described as the determination of an equilibrium within constraints.

A proposition that emerges from a disequilibrium approach such as that of Malinvaud is that Keynesian unemployment exists because money wages and output supply prices are too high. and persists because money wages and prices do not tend to fall with the rationing of jobs and sales. A key proposition of Keynes's analysis is that when inadequate aggregate demand leads to unemployment, wage and price flexibility makes things worse. This is because price and wage declines make it an ever-increasing burden for debtors to acquire cash to fulfill payment commitments due to debts. Keynes's dynamics explicitly include the repercussions on demand of financial interrelationships; standard theory largely ignores them. Any theory of employment that does not integrate agrregate-demand formation with the financing of investment and positions in capital assets cannot be called

Keynesian. Furthermore, an analysis that ignores finance cannot catch the essential cyclical features of a capitalist economy in which Wall Street exists and is important.

Standard economic theory does not examine the possibility that there are endogenous disequilibrating forces within a capitalist economy because of the way prices of capital assets are determined or how positions in capital assets and investment activity are financed. The issue is whether or not propositions relevant to a capitalist economy's development can be derived by studying theoretical constructs that ignore essential features of a capitalist economy. If economic theory is to explain financial crises, the inter-relationships between financial crises and business cycles, and how finance affects system behavior, then economic theory must examine an economy that is explicitly capitalist.

To a standard economic theorist such as Edmond Malinvaud, the proto-typical economy consists of consumers, producers, and an autonomous sector called government. It deals with only three commodities, called goods, labor, and money. It concerns the operations during one given period, which is analyzed independently of past and future periods (Malinvaud, 1977:38). Each item in this specification does violence to Keynesian perceptions of what must be studied and what must be explained and understood. Theorems about the stability of capitalist processes valid for a capitalist economy with sophisticated financial institutions cannot be developed in the framework of Malinvaud's prototype model (Arrow and Hahn, 1971:Chapter 14). The existence of capital assets, financial instruments, financial institutions, and money means that economic theory must deal with intertemporal relations in which the time frames differ for various decisions that determine system behavior. For standard theorists to study the problems of a capitalist economy, they must abandon their normal operating procedure of modeling village-fair economies and turn to modeling economies with a Wall Street. In such economies, financial instability that has occurred in a variety of specific institutional frameworks becomes a key fact to be explained. No theory of the behavior of a capitalist economy has merit if it explains instability as the result either of exogenous policy mistakes or of institutional flaws that can be readily corrected. Instability existed long before there was anything now recognized as economic policy and under a wide variety of banking and financial institutions.

A theory that links investment to the prices of capital assets, the prices of capital assets and the pace of investment to the functioning of financial markets, and the functioning of financial markets to profit opportunities in financial businesses will readily explain financial instability. Persistent unemployment is explained as the result of financial crisis that is allowed to lead to debt deflation. Thus persistent unemployment is an unconstrained, though transitory, state of monetary economy with a history that includes recent financial crisis and debt deflation.

The fundamental ingredients of a theory of the capitalist process are in *The General Theory*. The lesson from Keynes is that if the behavior of a capitalist economy is to be understood, money cannot be introduced into the argument as an afterthought. Nevertheless, this is what standard theory does. The first step in developing a theory of the behavior of a capitalist economy is to model money and financial relationships as integral parts of the determination of aggregate demand. One way is to model the money (or cash) flows that are set up by the financial structure and the way income is distributed.

Malinvaud introduced money as follows: "Let us consider an economy with r commodities $(n = 1, 2, \ldots r)$, the last one being money" (Malinvaud, 1977:18). Arrow and Hahn wrote: "Let the subscript "n" stand for money that we now regard as the non-interest-paying debt of some agency outside our formal system, say the government" (Arrow and Hahn, 1971:349). It is clear that the money of these theorists has no relevant resemblance to the money of capitalist economies. Arrow and Hahn recognized that they were violating reality in their definition and offered apologies for the primitive monetary ideas they explored; Malinvaud did not apologize, even as he offered his work as being relevant to the analysis of policy.

Wages and gross capital income are cash flows that result from the way income is determined. Gross capital income consists of rents, interest, taxes, conventionally labeled profits, and some, perhaps almost all, of the "executive and overhead" wages of business. Kalecki (1971:Chapter 7) showed how gross capital income is related to investment, government spending, the foreign balance, consumption financed by profits, and savings out of wage income. The Kalecki equations show the various conditions under which the profits of business can be large enough to enable business to fulfill its payment commitments on financial instruments. The linkages among business profits, fulfillment of commitments on financial instruments, investment, and financing enable us to understand why conditions conducive to financial crises emerge from the normal functioning of a capitalist economy.

The Kalecki equations also show why a full-blown interactive debt-deflation process has not occurred since World War II. An understanding of capitalist financial relations enables us to see the importance of lender-of-last-resort operations and why the postwar economy, which has been free of debt deflation, is now subject to chronic inflationary pressures. The financial-instability hypothesis is a variant of Keynesian theory closely linked to insights about profit formation most clearly stated by Kalecki.

III. Legacies from the past and endowments for the future

In every economy. today's capital assets and labor force are inherited from the past. and tomorrow's capital assets and labor force are partially determined by today's activity. A financial structure, related to ownership of capital assets and production of investment. is also a legacy from the past and an endowment for the future. Such intertemporal financial links and the payment commitments they embody are special to capitalism. In standard economic analysis. capital assets collected into plants are worked by labor to yield outputs. For simplicity. money wages are assumed to be given so that marginal and average out-of-pocket cost curves can be derived for outputs. This analysis ignores the conditions imposed on the functioning of a capitalist economy by the need to fulfill commitments on financial instruments and to use financial instruments to finance investment and the ownership of capital assets.

We start with a modern capitalist economy that has a complex and sophisticated financial structure. The decision units and financial relations of such economies take many different institutional forms. The theoretical result that inherited financial relations determine the relative stability or instability of an economy holds for a wide range of specific financial instability of an economy holds for a wide range of specific financial structures. In complex and sophisticated financial systems claims are layered structures. In complex and sophisticated financial systems claims are layered and there is specialization in financing practices. In particular. financial systems allow for a range of techniques by which firms control capital assets. A capitalist economy has markets in which real and financial assets are sold: markets and prices exist for current output. labor services, capital assets, and financial instruments. We also deal with an economy in which innovation (Schumpeter, 1934) exists in financial as well as in production processes and products (Minsky. 1957a).

As Keynes noted. "when a man buys an investment or a capital-asset. he purchases the right to a series of prospective returns, which he expects to obtain from selling its output. after deducting the running expenses of obtaining this output, during the life of the asset. The series of annuities $Q_1, Q_2, \ldots, Q_n$ it is convenient to call the *prospective* yield of the investment" (Keynes, 1936:136). The Q values are a series of cash flows that, as defined by Keynes, are the total revenues minus out-of-pocket costs (the running expenses of production). The Q values are a gross profit or a gross capital income. They provide the cash that the owners of capital assets are free to dispose of as they will – after providing for debts and taxes.

Production is carried on by firms. Capital assets, however, are collected into plants. Wages of variable labor and costs of materials yield running costs for a plant. The liabilities that a firm uses to finance capital assets and materials that flow through the plant may be linked to specific capital assets or plants (i.e.. by a mortgage) or to the general worth of the firm. In either case. the cash flow available to meet payment commitments on debts will arise from the total operations of the firm.

Debts commit a firm to money payments. These money payments are on both income account (interest, rent) and for the repayment of principal (because debts are due or are amortized). Modern accounting practice leads to a division of the gross income of capital net of taxes into income and capital-consumption portions. The capital-consumption portion can be likened to the repayment of principal of a debt. In essence, in a capitalist economy, capital assets (plant, equipment, and inventories) are like bonds: Keynes identified the quasi rents produced by such assets as a series of annuities.

In addition to producing firms that receive "annuities" from profits earned by capital assets. a capitalist economy includes a wide variety of firms that receive their annuities as cash flows generated by debts and other financial instruments they own. In a capitalist economy, two sets of profit-maximizing instruments they own. In a capitalist economy, two sets of profit-maximizing institutions exist: One owns capital assets and makes profits by producing and selling goods and services; the other owns financial assets and makes profits by producing and selling debts, both its own, which others hold. and others. which it holds.

As a result of their debt structure, firms operate today with cash-payment commitments inherited from the past. Furthermore. current investment and ownership of capital assets require financing. which sets up payment commitments for the future. Economics is a strange discipline in which present. past. and future coexist in time. A cash-flow approach to economic theory helps unravel some of the problems associated with time.

Profits are a central concern of the economic theory based on an integration of Kalecki and Keynes. This theory leads to the proposition that instability results from the normal functioning of a capitalist economy. Profits are determined by investment, enable business to honor payment commitments on financial instruments, and enter the determination of views as to future profits. Current views of future profits help determine current values of capital assets and decisions to invest. Inasmuch as future investment determines future profits, it is evident that business invests today because business is expected to invest in the future. But investment requires financing. Thus the terms on which financing is now available and is expected to be available determine investment. New financing is available only as past financing is validated by current profits. A key to understanding the behavior of a capitalist economy is the precise statement of the payments required by the liability structure and how cash to meet such commitments is generated.

IV. Cash flows, present values, and cash kickers

In standard economic theory, firms are characterized by the outputs they produce and perhaps by the technical, physical inputs they require for production: economic reality is analyzed by studying markets for commodities and services. The fundamental insight that guides standard theory is that an economy can be analyzed as if it were a village market.

For a study of the capitalist process, the structuring of economic reality into commodities and markets is of secondary importance. The analysis of cash flows (receipts and payments) has primary importance. Whereas standard theory views an economy as producing and consuming outputs, a Wall Street perspective views an economy as producing and allocating profits. The economy consists in a set of balance sheets in which assets generate cash receipts and liabilities state payment commitments. The problem that theory addresses is how assets generate cash and how relations among cash-payment commitments, anticipated cash flows, and realized cash flows affect system performance.

The gross flow of cash to a firm from its current participation in production is its sales revenues: these revenues, minus what Keynes called "running expenses," yield gross profits before taxes, which, following Keynes, we call Q. We ignore government spending and taxes for the moment. We therefore have a set of anticipated quasi rents or gross profits that we will label $AQ_1 \ldots AQ_n$. Firms may also own financial assets that yield cash flows as contracts are fulfilled.[2]

Liabilities set up demand, dated, and contingent cash payments. With more or less precision the current day's (0's) liability structure leads to a time series of payment commitments, $PC_1, \ldots, PC_n$. We therefore have two time series: one of anticipated gross profits, AQ_i, the second of payment commitments due to the liability structure, PC_i. Before an investment is viable, it is necessary that

$$(1) \qquad \sum_{i=1}^{n} AQ_i > 0$$

$$(2) \qquad \sum_{i=1}^{n} AQ_i > \sum_{i=1}^{n} PC_i$$

Cash in must exceed payment commitments.

We can split both anticipated quasi rents and payment commitments into two parts: $AQ(a)$, $AQ(y)$, and $PC(a)$, $PC(y)$, where $AQ(a)$ is the amount of quasi rents that represent the wastage or consumption of capital, $PC(a)$ is the amount of the payments on debts that is a repayment of principal, and $AQ(y)$ and $PC(y)$ are the net income part of the cash flows.

$$(3) \qquad AQ(y) = AQ - AQ(a)$$
$$PC(y) = PC - PC(a)$$

A *hedge-finance unit* is one for which

$$(4) \qquad AQ_i > PC_i$$

for all i, so that

$$(5) \qquad AQ_i - PC_i > 0$$

for all i. The value of the firm, E, is a capitalization value of the cash flows

$$(6) \qquad E = \sum_{i=1}^{n} k_i(AQ_i - PC_i)$$

K_i takes into account the felt assuredness, which Keynes called uncertainty, of the cash flow to the firm and depends on the market interest rates on different risk or uncertainty classes of assets. This relation is a variable over business cycles (Temin, 1976). For a hedge unit, a present-value reversal cannot occur as a result of a change in interest rates.

Consider an ordinary business firm that has payment commitments due to contracts of PC_i $(i = 1, \ldots, n)$. Ordinarily the cash to fulfill these payment commitments will accrue to the firm from current profits. However, a firm will find it advantageous to keep some cash or cash-equivalent assets on hand as insurance against interruptions in its cash receipts. These holdings will be related to sales revenues and payment commitments on debts. Thus a money position (which may consist largely of short-term financial assets) exists that is related to near-term running expenses X_i and payment commitments on contracts PC_i

$$(7) \qquad M_D = \sum_{i=1}^{m} (T_i(X_i) + L_i(PC_i)) \qquad (m \text{ small})$$

For a hedge firm, anticipated total revenues exceed running expenses and cash payments in every period; the need for M, except to bridge time gaps, is small.

For a *speculative-finance* unit

$$(8) \qquad \begin{array}{ll} AQ_i < PC_i & (i = 1, \ldots, m, \ m \text{ small}) \\ AQ_i > PC_i & (i = m + 1, \ldots, n) \end{array}$$

Furthermore, over the first m periods,

$$(9) \qquad \sum_{i=1}^{m} AQ_y(y) > \sum_{i=1}^{m} PC_i(y)$$

the income portion of quasi rents exceed the income (interest) portion of payment commitments. Such a unit has a portion of the principal on debt

falling due in the near term. and this debt repayment exceeds the capital-consumption or debt-repayment funds that its assets generate. Such a firm can fulfill its payment commitments only as it runs down its money assets or succeeds in placing new debts.

Speculative finance characterizes banks. other financial institutions, treasuries with floating debts. and ordinary business firms that roll over bank debt and commercial paper. The continuing normal functioning of such units depends on their ability to place liabilities: they depend on the normal functioning of financial markets. Whereas the value of a hedge-finance unit is positive for all interest rates. the value of a unit that engages in speculative finance depends on interest rates. The value will be positive for low interest rates and negative for high interest rates: A rise in interest rates can lead to a present-value reversal.

For a speculative-finance unit the demand for money is still given by equation (7). However for such a unit. $PC_i X_i$ ($i = 1, \ldots, m$) is greater than for a hedge unit. The demand for money and money-market assets is more a function of the payment commitments due to debts for units engaged in speculative finance than for units engaged in hedge finance. Speculative-finance units tend to hold money as insurance against refinancing failures. Because of this. we would expect L_i for speculative firms to be negatively related to interest rates.

There is a special kind of speculative-finance unit. a *Ponzi-finance unit*. for which the current income portion of payment commitments exceeds the current income portion of cash receipts. and such payment commitments exceed the anticipated cash receipts for all periods except some terminal periods. Symbolically. we have

(10) $AQ_i < PC_i$ ($i = 1, \ldots, n-1$)
        $AQ_i \gg P_i$ ($i = n$)

Furthermore.

(11) $AQ_i(y) < PC_i(y)$ ($i = 1, \ldots, n-1$)
        $AQ_i(y) \gg PC_i(y)$ ($i = n$)

For all except some end points of the horizon. current earnings do not meet payment commitments. The outstanding face value of debt increases as time goes by.

I have labeled such financial arrangements "Ponzi finance," recalling a Boston "swindler." However. these financial relations are much more widespread than the label I give them, which relates to pyramiding schemes. Ponzi finance characterizes any investment program with a significant gestation period. Furthermore, deals that involve holding assets the carrying costs of which exceed the income earned. so that the "deal" is profitable only

if the asset appreciates. are examples of Ponzi finance. The thin-margin stock market of the 1920s is an example of Ponzi finance.[3]

The present value of units engaged in Ponzi finance is sensitive to interest rates. Because $AQ_i(y) < PC_i(y)$ ($i = 1, \ldots, n-1$) and because $PC_i(y)$ increases when (short-term) interest rates rise. the outstanding debt of a unit engaged in Ponzi finance increases at a faster rate the higher the interest rates: furthermore. if AQ_n reflects the value of a capital asset. AQ_n will fall with rising interest rates. A unit engaged in Ponzi finance is especially vulnerable to present-value reversal.

Because Ponzi-finance schemes are always in the money market to finance positions. they might be expected to carry a significant amount of money and money-market assets. However. the pressure on such units to control financing costs by minimizing borrowing is great. Ponzi units often will be economizing on cash as well as dependent on refinancing conditions.

The formalization of cash-flow relations throws light on the emergence of financial instability. A hedge-finance unit. with its financial commitments in place. can fail to meet commitments only if the actual Q_i values fall short of anticipated Q_i values. However. in a simple capitalist economy. actual Q_i values depend on investment. Financial difficulties for a hedge-financing unit can thus occur only if a prior fall in income occurs. Inasmuch as financial crises do not depend on a prior fall in income. hedge-financing units cannot cause downward financial instability.

A speculative unit is constantly refinancing a portion of its liability structure. Its normal functioning depends on the normal functioning of financial markets. Its interest costs reflect changing conditions in financial markets. In particular. a rise in interest rates on debts will raise payment commitments even as there is no change in the quasi rents. A speculative unit can become a Ponzi unit, in the sense that for some periods $AQ_i(y) < PC_i(y)$ will be true when financial markets tighten.

Ponzi-finance units are especially vulnerable to changes in money-market conditions. Not only can their payment commitments increase beyond anticipated levels when interest rates rise. but a rise in interest rates may lead to a fall in the nth-period receipts that are expected to validate liabilities. This is so because the payoff receipts of a Ponzi scheme often reflect the value of a capital asset that will be delivered or sold, and this value is inversely related to interest rates.

Ponzi-equivalent finance characterizes the financing of much of investment in process. An investment project yields no revenues until the project is finished. The cost of production includes the interest costs on early expenses. The value of the project on completion is the present value of anticipated profits. which is inversely related to interest rates. When interest rates rise, the present value of Ponzi schemes can become negative; the value of the

AQ_n that makes the entire scheme viable decreases even as the accumulated debt, because of the excess of current costs (including interest charges) over early quasi rents, increases.

V. Robust and fragile financial systems

A financial system is robust when modest changes in cash flows. capitalization rates, and payment commitments do not appreciably affect the ability of private units to fulfill their financial commitments. Conversely, a financial system is fragile when modest changes in cash flows. capitalization rates, and payment commitments adversely affect the ability of private units to meet their financial commitments. However, a financial system does not exist in isolation. Its robustness or fragility does not depend soley on interactions within the financial system. Whether or not investment, employment, and profits are strongly affected by (1) small changes in financial variables and (2) the success of failure of debtors in fulfilling financial contracts is important in determining the robustness or fragility of the financial system. Neither finance nor income determination can be treated in isolation: the connections between them are strong.

The robustness or fragility of a financial system depends on two relations: the cash-flow characteristics of the financial system and the way financial-system behavior affects the cash flow that enable businesses. households. and financial institutions to fulfill their obligations. Furthermore. analysis of the stability of the financial system and the interactions between the financial structure and income determination needs to examine whether the fragility (and thus the stability) of the system is an invariant characteristic of the economy or whether it evolves (and if it evolves, what determines its evolution).

The financial-instability hypothesis holds that changes in cash-flow relations occur over a run of good (or tranquil) years and transform an initially robust financial system into a fragile financial system. The debt-deflation process identified by Irving Fisher during the 1930s presumably transforms a fragile financial structure into something more robust, whereas the financial changes over a run of good times transform a robust financial structure into a fragile one. The fragility/robust status of the financial system comes down to two questions: What determines the quasi rents that enable units to fulfill financial commitments? Does the structure of financial relations set limits to system performance that enable units to satisfy financial commitments?

Hedge. speculative, and Ponzi firms are all affected by changes in quasi rents. A shortfall of quasi rents from anticipated levels can make a hedge unit a speculative unit and a speculative unit a Ponzi unit. Inasmuch as a Ponzi unit's validating quasi rents result from selling out a position, such a shortfall

means that payment commitments on debts cannot be fulfilled. A decline in quasi rents can mean that the cash-receipt expectations of some debt owners will be disappointed.

A shortfall of quasi rents of a Ponzi unit from anticipated values can also mean that the cash receipts of a debt owner fall short of those anticipated. This refers to financial institutions that own such debts. The ability of these institutions to fulfill their stated commitments depends on a continuing flow of payments toward them on owned financial instruments. The degree of layering of financial institutions and the asset–liability mix of these institutions are parameters of the aggregate robustness or fragility of a financial system.

In the simplest Kalecki case, where aggregate gross profit (aggregate Q) equals aggregate investment, the shortfall of realized profits below anticipated profits requires a logically prior shortfall of investment. This leaves the generation of financial crises and deep depression, essentially unexplained, for it is the decline of investment that has to be explained. History records examples of triggering events in the form of collapse of some financial institution or business enterprise that led to financial crisis. There are also examples of financial institutions and business enterprises that collapsed, leaving masses of unpaid debts, that did not lead to a financial crisis. The failure of particular units to meet their payment commitments does not necessarily lead to generalized financial crisis. If a financial crisis is triggered by a particular event or failure of policy, the overall financial structure must be such that individual failure can trigger a chain reaction of failures.

A rise in interest rates lowers the capitalized value of a hedge unit but does not alter its payment commitments. A hedge unit's capitalized value (the E of equation 6) will decrease with a rise in interest rates. A rise in interest rates that lowers the market value of the firm also lowers the margin of safety that the excess of market value of shares over the nominal value of debt provides. Whereas this does not affect the ability of the firm to meet its payment commitment, it may well affect the terms on which additional debt can be issued. Inasmuch as the terms on which debt can be issued affect investment activity, investment will be reduced.

A rise in interest rates affects payment commitments and can thus transform a positive present value into a negative present value for speculative and Ponzi financial units. Speculative and Ponzi units must issue debt in order to meet payment and commitments. This means that they must always meet the market. Furthermore, they are vulnerable to any disruption, in the form of transitory unfavorable financing terms, that may occur in financial markets. A rise in interest rates that severely affects the value of a firm engaged in speculative or Ponzi finance will compromise its ability to issue

debt and will move a speculative or Ponzi unit to a higher risk class.

The risk class of a firm reflects views as to the likelihood that it will not meet its payments. If a rise in interest rate compromises the value of a speculative or a Ponzi unit. refinancing of maturing debt and issuance of additional debt will occur at terms that reflect this compromised net worth. Such higher terms further compromise the net worth. The process may not converge: before terms high enough to compensate the lender for increased possibilities are reached. the terms may be such that borrowers and default possibilities are reached. the terms may be such that borrowers and lenders alike will believe that default is inescapable. The existence of risk-compensated financing terms for a particular class of units may well depend on the level of riskless or default-free interest rates.

The stability of a financial system depends on the weight of hedge finance in the total private financial structure. The smaller the weight of hedge finance (the greater the weight of speculative and Ponzi finance). the greater the' possibility of a financial crisis. because the greater the likelihood that rising interest rates will lead to present-value reversals. Present-value reversals lead to the abandonment of investment projects that are under way and a decrease in new investment undertakings.

A financial structure that is dominated by hedge finance offers both inducements to invest and incentives to engage in speculative and Ponzi finance. Banks and other financial institutions are merchants of debt. They merchandise their debts to asset holders and finance various types of activities. Idle or excess cash balances in portfolios are potential raw materials for their lending. The substitution of short-term debt for long-term debt in financing asset holdings and investment in process provides a market for their loans. Banks and other financial institutions therefore have an incentive to induce speculative and Ponzi finance.

Stability is destabilizing. not initially to a recession but first to an expansion of investment. The determination of today's financing structure by the past behavior of the economy means that the financial structure becomes more susceptible to a financial crisis even as businessmen and bankers extrapolate the success in fulfilling financial commitments into diminished protection against a financial crisis.

VI. The generation of profits

There is no need to repeat Kalecki's demonstration that gross profits = gross investment + capitalists' consumption (Kalecki, 1971:78–92). Furthermore, these relations can be generalized. so that the following equation will hold: gross profits net of taxes = gross investment + export surplus + budget deficit − workers' savings + capitalists' consumption. These latter relations, in which profits are generated by the way in which the system works in terms

of investment, government size and scope, foreign balance, consumption habits of workers, and the distribution and use of profit incomes, link the income-generating process under capitalism to the cash flows needed to validate the financial structure. Kalecki's gross profits after taxes are the realized cash flows that enable firms that use debt to finance control over capital assets to satisfy their payment commitments. Whereas current profits determine whether or not units can fullfill their financial commitments, anticipated profits determine the willingness of bankers and businessmen to extend and to take on financial commitments.

In capitalist economies. prior to the 1930s. peacetime governments were small. There was no potential budget deficit that was large relative to gross investment. In such an economy variations in gross investment were well-nigh fully transformed into variations in gross profits. Thus a decline in investment led to an equal fall in gross profits. which could transform hedge units into speculative units. and speculative units into Ponzi units. even as net worths decreased. Such changes. along with an extrapolation of a decline in current profits into a decline in anticipated profits. lower investment. A recursive process in which a decline in investment yields a deterioration of cash-payment relations. which leads to a further decline in investment. will take place in a small-government capitalism.

If government is big. a fall in investment leads to falls in income. employment. and profits and to a substantial rise in the government's deficit. How big the deficit becomes and how rapidly it increases depends on the structure of the tax system and the nature of the government spending programs. In a modern welfare state. the income-maintenance schemes are such that expenditures rise rapidly with unemployment. and the tax system is such that a sharp decline in revenues takes place when income falls. Even without discretionary measures. the government deficit will increase rapidly when income turns down.

Big government acts as a breaker in the recursive process by which a decline in investment leads to a decline in profits. In the United States in 1974–5 the government deficit exploded to an annual rate of more than $100 billion in the second quarter of 1975. It is no accident that the second quarter of 1975 was the bottom of the recession and that an expansion that continued for at least 15 quarters (through Q1 1979. as this is written) started in 1975 III.

Big government is a powerful stabilizer of income and employment because of the direct impact of spending and taxes on demand and because a government deficit sustains business profits.

The other items in the extended Kalecki formula for profits are important determinants of system behavior and help explain business-cycle experience. Note that the export surplus shows up as positively related to profits. When a

country expands its budget deficit and this leads to a rise in imports, both domestic profits and profits of its trading partners are increased. The United States' balance of trade deficits after 1975 sustained both income and profits in its trading partners.

If workers buy consumption goods on credit, declines in income, employment, and business profits will be amplified as employed workers cut down on debt-financed spending. On the other hand, the evidence indicates that once unemployment stops rising, workers who experienced little or no unemployment increase their purchases of debt-financed consumer goods: this diminishes worker savings and increases income, employment, and profits.

There is an ambiguity in Kalecki's formulation of the determination of profits. Whereas the level of profits in consumption-goods production is determined by the condition that profits in the production of consumer goods equal the wage bill in the production of investment goods ($\pi_c = W_I N_I$), no such straightforward relation rules for the determination of profits in the production of investment goods. Total profits equal profits in the production of investment goods. Total profits equal profits in the production of consumption goods plus profits in the production of investment goods ($\pi = \pi_c + \pi_I$). The value of investment output is the wage bill in investment-goods production plus profits in investment-goods production ($I = W_I N_I + \pi_I$). It therefore follows that total profits equal investment output ($I = \pi_c + \pi_I$ for $\pi_c = W_I N_I$). However, to determine profits in the investment-goods industries it is necesary to refer to the supply conditions of investment output.

A large part of investment goods consists of unique items, tailor-made to the specification of the purchaser. Furthermore, the production of investment goods often involves significant gestation periods. Thus investment ties up liquid financial resources in work in process. These liquid financial resources often are borrowed from banks. In any case, an explicit contractual or an implicit opportunity-cost interest charge on the labor and material costs of producing investment goods must be covered by the supply price.

Bankers lend on a margin of safety. The expected sales proceeds from the production of investment goods should exceed costs of production, including interest charges on funds tied up over the gestation period, by some amount. This bankers' margin leads to a markup on costs that exceeds the interest charges by a substantial ratio. If the project is successful, the markup leads to realized profits. Thus the need to protect bankers leads to a supply price of investment goods that exceeds by a substantial margin the running costs of production.

To complete the story of profit determination in investment-goods production, demand conditions are needed. Once again banking and finance enter into the process in an essential manner. Debts to banks, other financial

institutions, and the open market are used by firms to finance positions in capital assets. Keynesian liquidity preference can be interpreted as a market view, depending on past experience and current expectations, of the appropriate liability structure for the financing of positions in debt.

The terms on which finance is available for the holding of capital assets determines the market price of capital assets. In Keynesian theory, asset and liability preferences yield for a given structure of financial institutions, a financing structure for business. This financing structure of business is the proximate determinant of the prices (explicit or implicit) of the capital assets that yield quasi rents (Minsky, 1975a:Chapter 4). That is, Keynesian theory is a two-price-level theory: one for capital assets and the second for current output. A link between the two is the way the price of capital assets becomes the demand price for investment. Financial-market conditions enter into the determination of investment in two ways: They determine the supply price of investment output, because they are a cost that must be recovered, and they determine the demand price, because the price of capital assets depends on the way positions in capital assets can be financed.

In modern capitalist economies, firms with market power have offer prices that involve a predetermined markup on out-of-pocket costs, although, as the preceeding argument indicates, markup pricing is a natural outcome of a banker's or finance officer's view of the economic process. Firms without market power earn a markup on out-of-pocket costs only if demand is "strong" (i.e., realized markups depend on aggregate investment). Such price-takers produce an unchanging output as long as demand price equals or exceeds out-of-pocket costs.[4]

In the simple Kalecki case, output is determined by the conditions that the sum of all profits equals financed investment. Financed investment yields the wage bill in investment output, which in turn must be reflected in the realized markups over wage costs in the prices of consumer goods. How realized profits are distributed among the various fixed and flexible markup outputs depends on the preferences of wage earners and other purchasers of consumer goods.

In a capitalist economy, prices, outputs, and employment are determined by the condition that profit equals investment (allowing for the modifications specified in the generalized profit equation). Investment depends on what is financed, which in turn depends on an excess of the demand price for investment over the supply price of investment output. The demand price of investment is derived from the market price of capital assets. The market price of capital assets depends on relations that Keynes identified under the rubric of liquidity preference, one of which is the liability structure that is "acceptable" for the financing of positions in capital assets. All other things being the same, the easier the cash-flow constraints embodied in balance

sheets, the higher the price of capital assets. The supply price of investment output includes financing costs during gestation periods and the bankers' margin of safety in financing such outputs.

In a capitalist system the terms on which bankers (broadly defined to include commercial, investment, and merchant bankers) finance positions in capital assets and the production of investment output are critical determinants of system behavior. Such financing directly affects profits and thus whether or not current income validates the inherited liability structure.

VII. The turning points: upper and lower

In business-cycle analysis it was usual to consider two cumulative processes (expansion and contraction) and two turning points (upper and lower) (Haberler, 1937). In the study of financial crises, the upper turning point is of special interest, for a financial crisis often occurs in the neighborhood of the upper turning points of deep-depression cycles. It is convenient to distinguish between the evolutionary process that leads to the emergence of balance-sheet relations that are conducive to financial crises and the events that trigger it.

The profit equation of banks and the profit opportunities from holding leveraged capital assets for income or appreciation together show that even an initial condition dominated by hedge financing is unstable.[5] In an economy dominated by hedge finance, there are profit opportunities in shifting toward a larger mix of speculative arrangements. This is so because the supply conditions for short-term finance lead to lower financing costs for those who can qualify. A rise in the mix of speculative finance in the total increases demand for and thus the price of capital assets. This leads to increases in investment demand, in investment that is financed, and in profits. During a shift to speculative finance, profits increase in the aggregate. This validates the decisions of those who lent and those who borrowed to engage in speculative finance (Minsky, 1975a:Chapter 4 and 5).

Banks and other financial intermediaries are both lenders and borrowers. As lenders on short term, they induce speculative finance in others. As borrowers, idle hoards of cash are the raw materials for expanding loans. They have an incentive to develop liabilities that enable those who would otherwise hold cash to dispense with cash. As a result, banks stand ready to furnish cash to two sets of clients: their borrowers and their depositors. Banks need to have secure means for acquiring cash at their own initiative. In the theory of banking, assets that enable banks to acquire cash are often called secondary reserves. In a world where banks are active profit-making institutions that manage their liabilities, the instruments used to acquire cash

when needed are the position-making instruments. The cash manager of a modern corporation or bank has a variety of position-making instruments and actively juggles short-term debts and assets among a range of them.

For an instrument to qualify as effective in position making, sizable transactions in it must be executed without generating large changes in its price. The market for the instrument must be broad, with many buyers and sellers, and, in many cases, a residual market maker. The residual market maker is usually (but not necessarily) the central bank.

Some assets and liabilities are not good generators of cash at the initiative of the money-position manager. If financial positions develop in which managers of the cash of corporations or banks are forced to try to raise cash by selling out such assets or issuing such liabilities, the cash realized by such sales or by such liabilities can fall short of anticipated levels. In particular, a wide attempt to make position by selling an asset that is not usually used for the purpose can lead to a large fall in the market price of such assets. This happened in 1966 when banks tried to make position by selling municipal bonds. Such an attempt to make position by selling out positions characterized the rapid stock-market decline in 1929, the sales of foreclosed real estate in the years of the Great Depression, and much of the difficulties of real estate investment trusts in 1974–5.

The shift of a financial system from a structure that is inhospitable to financial crises to one that is hospitable has two characteristics; one is an increasing weight of speculative finance; the second is greater dependence of banks, financial institutions, and ordinary businesses on their ability to make position by the sale of liabilities rather than by the use of money or liquid and guaranteed assets.

The flow-of-funds data prepared by the Federal Reserve yield ample evidence that the weight of short-term and therefore presumptively speculative finance in the total financial structure of nonfinancial corporations in the United States has increased over the years since 1946. The same body of data shows that the money (demand deposits and currency) holdings of nonfinancial businesses have decreased relative to sales, profits, and financial obligations. Any chronicle of developments in banking and finance shows that position-making techniques have become more complex; in particular, bank position making has shifted from operations on an asset traded in a highly protected market (Treasury bills) to operations in a variety of liabilities. Furthermore, active liability juggling has spread from commercial banks to finance companies, other financial institutions, and nonfinancial businesses. The greater the need of units to manage their liabilities, the greater the susceptibility of the system to financial failures. That the shift to a financial structure conducive to financial crises is consistent with the

profit opportunities that exist from managing liabilty structures in a regime of robust, predominantly hedge finance is borne out both by the numbers and by chronicles (Minsky, 1966, 1973, 1975a, 1975d, 1977).

An investment project is like a contract to make payments along a more or less precisely defined timetable. Although not all investment is as large scale and complex as a nuclear power plant, construction of a nuclear power plant can serve as a model. A large or even an ordinary human-scale investment project involves the "on-the-site" construction and assemblage of components in a relatively well defined sequence. This requires coordinated production of components that go into the plant. Thus a payment schedule by contractors and manufacturers to workers and suppliers is an integral part of the investment process. Ongoing investment involves a maze of financing relations. An investment boom is accompanied by increases in the volume and complexity of financial relations.

The financial arrangements of an investment project conform quite closely to the characteristics we have identified with Ponzi finance. Over the construction period, committed payments exceed revenues from the project. Furthermore, at the end of a period, lump sums are paid by the purchaser that presumably cover payments made by the builder during construction. The financing arrangements in the American construction industry, where there is a clear distinction between construction and take-out financing, conform to the relations that have been characterized as Ponzi finance.

The cash-flow relations in investment in progress make Ponzi finance an essential and not a peripheral characteristic of the financial structure of capitalism. The cost of the investment output that is produced and must be recovered by the sales price of the investment good as a capital asset is positively related to the short-term rate of interest, even as the market price of the capital asset is negatively related to the long-term rate of interest. If investment-goods financing conforms to our model of Ponzi finance, if an investment boom leads to an increase in both short-term and long-term interest rates, and if such investment boom takes place in a financial structure heavily weighted by speculative and Ponzi finance, the upper turning point is completely endogenous. Under these circumstances a rise in interest rates will cause present-value reversals; the present value of some Ponzi-financed investment in process will change from positive to negative. Similar reversals will happen for some units that are speculatively financed but are not financing investment. Furthermore, the rise in interest rates will lead to declines in the values of firms that are hedge financed; this decreases margins of safety and lowers credit standing. Increases in specific financing terms relative to the rates typically chronicled by the time series will take place.

The rise in the cost of investment projects above the expected value of the completed capital asset leads both to a decrease in new investment under-

takings and to failure of ongoing investment projects to obtain the cash needed for completion. Inability of units engaged in speculative and Ponzi finance to refinance institutions fall short of contract net amounts. Such units now have to acquire cash by issuing new liabilities or selling assets. Meanwhile, units with refinancing problems try to stay afloat by selling assets. Under these circumstances the prices of assets used in attempts to make position fall, and the terms on liabilities that are offered in the market increase.

The drying up of finance and cash shortages decrease investment, which cuts profits. Realized quasi rents fall below anticipated quasi rents. The fall in profits leads to a further decline in the present values of firms. Conservative hedge units become embarrassed speculative units.

The upper turning point is completely endogenous once it is accepted that interest rates rise in an investment boom and that the successful functioning of the economy induces profit-seeking bankers and their customers to engage in speculative financial arrangements and to economize on holdings of money and protected financial assets. For interest rates not to rise during an investment boom, the supply of finance must be infinitely elastic, which implies either that a flood of financial innovation is taking place (Minsky, 1957a) or that the central bank is supplying reserves in unlimited amounts. But this in turn, implies that investment is an ever-increasing proportion of output and that accelerating inflation is tolerable (Minsky, 1957b).

Although endogenous market processes lead to incipient financial crisis and an upper turning point, the extent of the financial crisis and whether or not a debt-deflation process takes place depend on how quickly and aptly the central bank intervenes as a lender of last resort and whether or not government deficits stabilize profits. In 1974–5 the Federal Reserve and the government deficits stabilize profits. In 1974–5 the Federal Reserve and the giant banks promptly intervened as lenders of last resort and so allowed the profit-generating effects of the massive 1975 government deficit to take hold. This led to an early and high lower turning point. In 1929–33 the Federal Reserve dithered, and government tried to balance its budget. This led to a delayed and deep lower turning point. The 1975 lower turning point was followed by a quick, although perhaps incomplete, recovery, with continuing inflation. The 1933 lower turning point was followed by a long and deep trough.

VIII. The lender of last resort

In a capitalist economy with a complex, sophisticated, and responsive financial system, the dynamics introduced by profit seeking into the balance-sheet structures of banks, financial institutions, business organizations, and households assure that a run of good times will be accompanied by an

increase in the importance of position-making activity as well as by changes in the instruments and markets used. The passive management of liability structures that characterizes a highly liquid financial structure dominated by hedge finance is a transitory state that follows either a deep and prolonged depression after a debt deflation or a large increase in government debt due to a great war. Active liability management means that a modest shortfall of cash from operations or a rise in other claims on quasi rents will lead to a need to raise cash by operations in position-making instruments.

In the first decade after World War II, position-making activity was carried out mainly by operations using Treasury bills. Any rise in the need by banks or others to raise cash by selling Treasury bills led to an infusion of Federal Reserve credit, either directly through an open-market operation or indirectly through the support of bond dealers at the discount window. The Federal Reserve prized orderly conditions in Treasury debt markets and remained in close and continuous contact with the money market. Position making took place by means of operations in a market protected by the Federal Reserve. Because the Federal Reserve was operating in the Treasury security market, both as fiscal agent for the government and in its effort to control the economy, the Federal Reserve was a constant participant in the position-making market.

As position making became more a matter of liability management, the Federal Reserve lost its day-to-day contact with the markets in which positions were made, and position-making instruments were no longer protected by the Federal Reserve. As a result, rapid swings in the price, terms, and even the availability of cash through markets that were being used for position making became possible. Furthermore, any rise in interest rates or restrictions on availability of reserves led to an active exploration by units needing cash for new or exotic sources of cash. Complex convoluted procedures were adopted. Markets for new instruments grew rapidly. Inasmuch as these markets were exposed to rapid fluctuations and lacked central-bank protection, "local failure" could lead to sharp rises in financing terms and restrictions on the availability of bankers' cash.

With the development of closely articulated cash management, the need for central-bank constraints to control and restrict speculative finance increased. However, the Federal Reserve was not in touch with the emerging financial markets, and its seems to have missed the significance of the evolutionary changes that were taking place. In the closely articulated cash-management system that developed, not unusual events triggered serious financial market disruptions in 1966, 1969–70, and 1974. In each episode the Federal Reserve was forced to intervene to protect the viability of the financial system by acting as a lender of last resort that made cash available or promised to supply cash.

Three distinct aspects of the lender-of-last-resort function can be identified. One is the provision of funds to the money market when position-making activity leads to a sharp fall in the price (or a sharp rise in the interest rate) of position-making instruments. The second is the restructuring of the finances of various organizations in the aftermath of a crisis, so that the weight of Ponzi and speculative finance is decreased. The third is to guide the evolution of the financial system so that the central bank remains in touch with the position-making markets and so that the weight of speculative and Ponzi finance is constrained. The first or emergency intervention is the traditional lender-of-last-resort intervention (Kindleberger, 1978:Chapter 9).

When the price of the asset normally used in making position falls so that the required cash cannot be raised by dealing in that asset, the cash-short organization will turn to the sale or hypothecation of other assets. Asset prices can fall rapidly and across a wide spectrum of assets as organizations try to make position by selling out position. Once this spreads, the ability to borrow, and even the solvency, of many institutions is impaired. The central bank has a responsibility to prevent a generalized fall in asset values by providing funds for position making through conventional assets or by extending credit to organizations with refinancing problems. The central banks' primary responsibility is to assure that asset values are sufficiently high so that insolvency is always a local condition, not a general condition; in particular, the lender-of-last-resort function aims to assure that a generalized fall in capital-asset values will not occur when such assets are offered for sale by units that need cash to make position.

A central bank's lender-of-last-resort function is of greater importance the greater the proportion of speculative and Ponzi finance in the structure of financial relations. Once an investment boom that is associated with a sharp increase in speculative and Ponzi finance breaks, business organizations with profit expectations that can support a long-term debt structure at normal interest rates may be unable, through cash flows and refinancing at boom or crisis financing terms, to validate a debt structure heavily weighted by short-term finance. It is the responsibility of the central bank as the lender of last resort to facilitate the restructuring of debts so that in the aftermath of a crisis the weight of hedge financing increases in the total financial structure.

In short, the internal dynamics of a capitalist economy lead to financial structures that are conducive to financial crisis and income instability. It is the lender of last resort's responsibility to prevent the position-making difficulties of some institutions to lead to a generalized fall in asset values and to facilitate a recovery from a recession by aiding and abetting the restructuring of debts so that the weight of speculative and Ponzi finance in the system is decreased.

It is also a responsibility of the central bank to guide the evolution of the

financial system, either by legislation or by its operations, so that the actual and potential weights of speculative and Ponzi finance are constrained. The Roosevelt-era reforms that changed the nature of the standard American mortgage and cut down on the ability of investors to finance positions in common stocks with thin margins were financial reforms that diminished the potential for instability by erecting barriers to speculative and Ponzi finance.

Over the past decade, the Federal Reserve has been remiss in its responsibilities to guide the evolution of American finance so that the development of conditions conducive to financial crisis would be slowed, if not reversed. In particular, the Franklin National crisis of 1974–5 indicated that positive steps to control and constrain the offshore banking community were necessary. In the years since 1975 the Federal Reserve and other central banks have been remiss in doing little or nothing to constrain the further expansion of offshore speculative financial relations.

IX. Conclusion

The financial-instability hypothesis is an economic theory that emphasizes the financial relations that are special to capitalism. As such, it is an alternative to today's standard theory, which attempts to derive truths about capitalist economies from theories that ignore the capitalist aspects of the economy.

The financial-instability hypothesis leads to important propositions about system behavior beyond those emphasized here: that the internal workings of a capitalist economy generate financial relations that are conducive to instability and that the price and asset-value relations that will trigger a financial crisis in a fragile financial structure are normally functioning events. One further proposition that follows from the financial-instability hypothesis is that if the debt-deflation interactive process that leads to deep depression is quickly aborted by the deficits of big government and by lender-of-last-resort intervention, then an inflationary recession will take place. The financial-instability hypothesis leads to the view that money prices reflect the basic operating characteristics of the economy; they are not something that is tacked on to a prior-determined set of relative prices.

A major implication of the financial-instability hypothesis is that policy for a capitalist economy must recognize the limitations and flaws of capitalism if it is to be successful. In particular, as long as an economy is capitalist, it will be financially unstable; however, as a comparison of the unstable mid-1920s and the unstable mid-1960s to date shows, the overall behavior of the economy can be quite different. That is, all capitalisms are unstable, but some capitalisms are more unstable than others. Furthermore, the system

characteristics that result from the underlying instability can be quite different.

Notes

1 As Professor Kindleberger notes, the financial-instability hypothesis, which, flattering me, he calls the Minsky model, has a distinguished ancestry, for "it is a lineal descendant of a model, set out with personal variations by a host of classical economists including John Stuart Mill, Alfred Marshall, Knut Wicksell and Irving Fisher" (Kindleberger 1978: 15). Karl Marx and John Maynard Keynes belong on the list of great economists who held that the capitalist process is endogenously unstable.

2 The most detailed analysis of cash-flow relations that I have set out is for financial institutions (Minsky, 1975a).

3 At the Bad Homburg conference Raymond Goldsmith and Robert Solow took exception to my label "Ponzi Financing" for financial relations that can be validated only if at some later date a sufficiently large payment is received. Raymond Goldsmith went so far as to use the term "demagogue." In the initial formulation of these ideas I emphasized the "fraudulent" and "bubble" aspects of this type of finance, but the experience of the real estate investment trusts and an appreciation of the sequential relations in the financing of investment led me to recognize that the type of financial relations that I label Ponzi finance is a quite general and not necessarily fraudulent characteristic of a capitalist financial structure. Financial relations the validation of which depends on the selling out of positions are a normal functioning part of the capitalist process. Furthermore, every "bubble" or stock-market speculation in which profitability depends on the timing of entry and exit is of the nature of a "Ponzi scheme."

However, the label attached to the financing relations I identify as Ponzi is not important. What is important is whether or not such structures exist and what effect such financing has on system behavior. In particular, if Ponzi financing exists, if the extent of Ponzi financing determines the domain of instability of the economy, and if Ponzi financing is a normal adjunct of investment production, then there are normally functioning endogenous factors that make for significant instabilities.

Incidentally, what in retrospect appears to be a fraudulent operation often has its roots in a "speculative" or "honest Ponzi" financial arrangement where the "payoff" is not forthcoming as anticipated. "Fraud" often is an ex-post result and is not always ex-ante in conception.

4 The chronic problems of agricultural credit under free-market conditions may reflect the banker's abhorrence of price structures in which price is not built up by suppliers out of costs. Agricultural producers cannot offer bankers the protection that a firm offer price provides. Hence the reform of agriculture in a market economy involves some combination of two "forces" – the promotion of a cartel by government or the provision of finance outside of normal banking channels.

5 A bank's profit identity can be written as

$$\frac{\text{earnings}}{\text{assets}} \times \frac{\text{assets}}{\text{equity}} = \frac{\text{earnings}}{\text{equity}}$$

Earnings = revenues − cost of money − operating costs. Bankers operate on their assets/equity ratio and their earnings ratio; bankers and those who oversee banks are often in conflict as bankers operate to increase their assets/equity ratio.

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Comment

J. S. FLEMMING

Minsky's chapter presents two arguments relating to economic stability, but although both have a financial dimension, neither is a distinctively financial (as opposed to monetary) mechanism. Clearly, in making this statement, I am rejecting claims implicit in Minsky's exposition. Unfortunately, that exposition is so deficient in clarity and precision as to obscure the constuctive content. Malinvaud (1977), on whom Minsky is quite unnecessarily harsh, is a model of the explicit theorizing that is missing in this essay — an omission not made good in the author's other works to which we are referred.

To mention but two such problems, Minsky consistently indentifies income concepts (usually defined on an accruals basis) with cash flows. If financial instability is associated with price-level instability, this identification is particularly unfortunate: a sources-and-uses-of-funds statement contains a lot more information on cash flows than does a balance sheet. Minsky also persists in giving a casual significance to Kalecki's famous arrangement of the national-income identities.

Perhaps more important than these problems is Minsky's failure to do justice to those mainstream macroeconomist who have emphasized both finance and stability. Tobin's approach (1969) to investment through the financial-valuation ratio q is entirely in the spirit of Minsky's remarks and has been implemented empirically by Ciccolo (1975) and von Furstenberg (1977). Minsky's explanation of investment relies, I believe appropriately, on a two-sector model. This is not novel; Sir John Hicks's famous 1935 interpretation of *The General Theory* was explicit on the point, as was Witte's account (1963). Moreover, contrary to what is said in Section II, mainstream economists have examined the possibility of instability when there are many assets (Hahn, 1966), some of which may be financial.

Minsky misrepresents the new "disequilibrium" approach of Barro and Grossman (1976) and Malinvaud (1977) when he says that it suggests that Keynesian unemployment exists because money wages and prices are both too high and too inflexible. Their analyses equally support the view that it is due to too small a supply of money. Minsky nowhere substantiates his

implicit claim that unemployment can be explained in terms of financial disequilibrium without reference to wage stickiness or other reasons for nonclearance of the labor market.

I share Minsky' view that Keynes rightly asserted that wage and price flexibility may make things worse. However, it is not true that this mechanism depends on the existence of a sophisticated financial structure – money is enough. Keynes's own argument (1936:265) appears to rely on extrapolative expectations of deflation raising the ex-ante real interest rate depressing investment even if the nominal interest rate falls to zero (see also Tobin, 1969). It can be shown (Flemming, 1979) that increased wage flexibility may destabilize employment even if expectations are rational. Such destabilization is particularly likely if wage flexibility is low and monetary policy is aimed at stabilizing nominal interest rates. Although, as mentioned, these arguments do not require a complex debt structure, deflation-induced bankruptcies would presumably aggravate the instability.

Similarly with Minsky's argument for the endogeneity of crises. He refers several times to the following mechanism: Suppose an economy is, in fact, subject to random shock generated in a stationary way. A chance period of stability will be misinterpreted as implying that fewer precautions need be taken, thus increasing the economy's vulnerability to the next "normal" shock. As applied to financial structures, enterprises adopt excessively exposed geared, levered positions in a period of stability that does not, in fact reflect a favorable shift in the economy's stochastic environment.

This mechanism is, of course. extremely general; it may account for wars and certainly plays a role in epidemiology. A period of random quiescence by the influenza virus may reduce participation in immunization programs and increase the severity of the next outbreak. Both of these examples have implications for economic stability – as, more directly, does the case of farmers who respond to a temporarily stable weather pattern by planting less robust or less diversified varieties. Whether the financial version of this story is economically more significant than the real version, with which it is compatible, is not clear, but the economic relevance of the mechanism is by no means restricted to capitalism.

In either case, the argument depends on agents failing to distinguish a run of good luck from a favorable structural shift in their environment. Such errors are not only identifiable but also optimal if agents attach the correct nonzero probability to structural changes. If Minsky believes that people are too willing to believe that such changes have occurred, he should consider suggesting to the authorities that they intervene randomly in financial markets – by increasing their variance, such intervention would hinder the recognition of genuine shifts and should also inhibit false inferences.

This suggestion depends on agents not being able to observe the authorities' interventions. More generally, interventions of the kind Minsky advocates for the lender of last resort encounter the objections of the rational-expectations school that the stabilization policy will be offset by individuals expectations. Minsky does not address this position adopting a more risky position. As we have just seen, he explicitly, and his own remarks are inconsistent. As we have just seen, he does stress an argument relying on a feedback from observed tranquility to more fragile financial structures. Presumably, this would apply to policy-induced tranquility, rendering the latter unfeasible. Yet Minsky attributes postwar stability to the enlarged role of government. Clearly, a more explicit and quantitative development of the presently ambiguous theory of financial instability is called for.

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Comment

RAYMOND W. GOLDSMITH

I entirely agree with Professor Minsky's opening plea for an integration of theory of the financial system with that of the real economy, and for the need to understand financial development in any analysis of the modern economic process. That, however, unfortunately, is almost where our agreement ends. I

do not believe that his hypothesis of endogenous financial instability, notwithstanding some interesting observations and suggestions, provides an explanation of the financial development of a modern economy.

For brevity's sake I shall mention only three of the many doubts I have about Professor Minsky's theories, facts, and interpretations that I regard as important: the lack of a definition of financial crisis, the conflict of the implications of his hypothesis with economic history, and his choice of terminology. I shall thus pass by several other important criticisms (e.g., his failure to distinguish adequately between financial crises and business-cycle upper turning points and his undue reliance on oversimplified, aggregative Kaleckian identities).

Failing to find a definition of financial crisis in Professor Minsky's chapter (or, for that matter, in Professor Kindleberger's book), I shall offer one of my own for discussion: a sharp, brief, ultracyclical deterioration of all or most of a group of financial indicators – short-term interest rates, asset (stock, real estate, land) prices, commercial insolvencies, and failures of financial institutions. This definition would exclude several of Professor Minsky's so-called financial crises, particularly the minor financial difficulties experienced in the United States in the 1960s and 1970s, on which he puts so much emphasis, erroneously I feel, as they were at most potential or near-crises. Note that I do not regard foreign-exhange difficulties as a necessary concomitant of a financial crisis.

My main empirical argument against Professor Minsky's hypothesis is that its implications run counter to the evidence of economic history. It is implied in the hypothesis, more clearly in his recent evidence before the Joint Economic Committee (*Special Study of Economic Change*, 1978: 847 ff.) than in the chapter before us, that the larger a financial system grows in relation to the economy and the more complex and layered it becomes, the greater its fragility and its proneness to financial crisis, and the more serious its effects on economic development. Now it is a fact that over the past century and a half the financial systems in practically every country, developed or less developed, have become relatively larger and more complex by any measure we may want to apply, such as the relation of all financial instruments or of the assets of financial institutions to national product or wealth or to the size of the financial superstructure. It is also a fact that financial crises have become rarer and less acute and indeed have almost disappeared since the early 1930s, a period of nearly half a century, in sharp contrast to the decennial recurrence in the preceding century. Financial crises are a childhood disease of capitalism, not an affliction of old age. This contradiction alone is sufficient, it seems to me, to invalidate the financial-instability hypothesis.

Finally, the question of terminology. It may be argued that an author is free

to paste any name he wants on the phenomenon he describes. I do not think so. We must, I believe, remain as close as possible to the common and common-sense usage of the terms we employ, and shun terms that are definitely misleading. From this point of view, the use of the term *speculative finance* for activities that are as widespread and basically sound (because based on the law of large numbers) as the business of a savings bank or any other financial institution whose assets have legally a longer maturity than its liabilities is unfortunate. To apply the term *Ponzi finance*, derived from a fraudulent and basically unsound (because inherently defective) scheme, to as commonplace an operation as construction loans, for example, which work out perfectly well year-in-year-out in more than 99 out of 100 cases, is irresponsible. It is, I am sorry to have to use a harsh word as the author seems unwilling to abandon his terminology, demagoguery. *Amicus Hyman, magis amica veritas.*

Comment

JACQUES MELITZ

In arguing from a non-Marxist standpoint that capitalism is increasingly prone to financial crises, Minsky undertakes a courageous and thankless task. Fellow non-Marxists will only take offense, and the encouragement of Marxists will bring him few new friends. Minsky maintains that individual balance sheets under capitalism tend to evolve in such a way as to make random economic shocks likely to generate a cumulative percentage fall in aggregate financial wealth. In other words, the elasticity of influence of plausible negative shocks on aggregate financial wealth is sizably greater than one. His hypothesis is one of "financial fragility" rather than "financial instability," though he uses the terms interchangeably. That is, according to him, crises are not inevitable; they merely become more likely. Metaphorically, it is not that the patient will predictably become ill; he just gets more and more susceptible to illness. Even this susceptibility is perfectly clear only if we abstract from certain kinds of antibodies (essentially remedial actions by a "lender of last resort") or if we consider them as events from outside the system.

Some parts of Minsky's argument, I confess, evade me completely. This encompasses most everything he has to say about the real sector of the economy, and in particular his references to Kalecki's equations, which strike me as accounting relationships that are compatible with all possible states of events. Accordingly, I shall confine my remarks to the financial side, where his meaning comes across more clearly to me. My comments will bear

on three aspects: (1) Minsky's emphasis on "speculative" units, (2) the supposed tendency of expansionary phases of business cycles to heighten the financial fragility of capitalism, and (3) the generality of the fragility thesis, or, more exactly, its supposed application to capitalist economies generally.

1. Minsky's starting point is a distinction between "hedging" and "speculative" units, the "Ponzi finance" units being an extreme example of the speculative ones. Specifically, the distinction revolves around the time profile of the individual's anticipated income receipts in relation to the time profile of his contractual debt payments over a near-term horizon. The speculator is someone who does not foresee enough income to cover his contractual debt obligations in the short run. Therefore he necessarily plans to sell assets or to borrow in order to meet his obligations. That makes him vulnerable to current conditions in asset markets, which is the basic source of danger to him. Minsky agrees also that "speculators" do not borrow with the intention of running down their capital *permanently*. Hence for any given flow of expected income receipts, the extent of speculative finance, in his conception, depends entirely on the term structure of the debt. The shorter the term structure, the larger the aggregate of current debt payment obligations that run ahead of the aggregate of current income receipts.

As a starting point, we may note that this view has some paradoxical implications. For example, we know that the term structure of the debt is, at least partly, a creature of the time profile of interest rates. When long-term rates are below short-term rates, the market tends to manufacture debt of a higher average term to maturity. It then follows, in the terms of Minsky, that a falling term structure of interest rates means a more robust financial structure. Accordingly, conditions of anticipated price deflation, such as ruled in the late nineteenth century, are then healthy ones for the financial system. These are not particularly convincing results. But over and above this, Minsky's concept of speculative finance (his index of the fragility of the financial system) depends entirely on the time unit in which income is measured (or the duration of the "short run" of the preceding paragraph). If we take a long enough income period, all debtors are "hedgers." Similarly, if contractual debt payments are lumpy and income receipts continuous, then for short enough income periods, all debtors are "speculators." For any given length of income period, an individual is likely to chnage status automatically from a hedger to a speculator as his maturity date approaches. Can any measure of speculative activity of this sort really provide a useful index of the robustness or fragility of the financial system?

What Minsky is essentially trying to get at is the extent to which capital losses resulting from rises in interest rates will trigger a cumulative, cascading effect on wealth stemming from efforts to meet outstanding debt commitments. From a general economic standpoint, this will depend mainly

on two factors that Minsky's classification between hedgers and speculators fails to consider: first, how much people *choose* to sell assets of *variable nominal price* in order to meet debt commitments; second, what are the wealth and price elasticities of the net stock demand (the stock demand minus the stock supply) for these assets. One fact that Minsky tends to disregard, in this connection, is that people dispose of money or debt assets of fixed nominal price. Those who decide to meet debts out of capital over any time nominal price. Those who decide to meet debts out of capital over any time interval may decide to do so by decumulating money. If they have stored enough money for this purpose, they may then not envisage ever selling even a penny's worth of variable-price assets in order to meet their obligations, and thus may not pose any threat at all from Minsky's point of view. On the other hand, those who need not pay out of capital (or, more precisely, those who anticipate income receipts in excess of contractual payments at all future intervals) nonetheless may plan to sell bonds and equities at some points in the future in order to meet their payments, preferring to allocate their contemporaneous future income receipts to some other ends.

It is highly noteworthy also that a shorter average term of the debt lowers the fall in capital values that can be generated by a rise in interest rates. Thus, although, as Minsky says, a lower average term to maturity implies more debt to be financed during any given time interval (more speculative finance, in his sense), it also means a smaller fall in captial values for any given rise in interest rates. This is further reason to think that a shorter average term need not spell a higher risk of financial catastrophe.

The usual balance-sheet index of the soundness of a financial position has nothing to do with the term structure of the debt; it concerns the total debt relative to total assets, or the debt − equity ratio. Perhaps this is sensible.

2. What about Minsky's argument that capitalist economies become financially more vulnerable during expansions? Even if we reject his notion of speculative finance, this argument deserves careful attention, because there is clearly good sense in his assertion that a succession of good years will increase optimism and therefore readiness to assume risk. In fact, even without supposing that people become more sanguine toward risk bearing during good times, it follows from standard assumptions that the rise in expected returns over the short run during those times will induce the ordinary risk averter to hold a riskier position. What implication does this have for the harm that a negative shock will perpetrate on the economy? Obviously a negative shock will have a negative effect, and if the elasticity of influence is greater than 1, this negative effect will be more than proportional. But what Minsky must mean is that the elasticity of influence will be higher near the peak than near the trough (or otherwise there would be no reason why the economy would be more vulnerable to negative shocks during good times than bad times). Yet I do not think that he offers adequate support for

this view. The higher riskiness of individual portfolios during good times simply means a higher variance of expected returns on the portfolios. By no stretch of the imagination does this imply a higher proportional loss if interest rates rise (or any other negative shock takes place). From a strict empirical standpoint, it has never been shown that the sensitivity of aggregate equity and bond values to interest rates grows systematically in the expansionary phase of the cycle. Thus, even if we grant Minsky that individuals take more risks during expansions, he still lacks a clear argument for higher *collective* risk during these periods.

3. Finally, what about Minsky's claims to discuss capitalism as a whole? This assertion is puzzling in a work in which the basic examples derive solely from the U.S. experience. In fact, I find Kindleberger's book (the other primary text for this conference) to be largely a foil for Minsky's chapter, because it calls to our attention the wide range of historical and international experience of crises that Minsky pretends to encompass.

One limiting factor in Minsky's reasoning is his unqualified view of the essential contribution of financial intermediaries to financial crises. Commodity-market speculation is a fact of life, and Kindleberger reminds us of many commodity bubbles in the past. Does a financial crisis then necessarily require the help of financial intermediaries? Why may such intermediaries not be a stabilizing element in a commodity-market crash? Of course, there are historical examples of financial systems that were notoriously unstable. However, this may be the result of the specific institutional arrangements at the time. Is this a Panglossian view, and, if so, where is the evidence? The only general reply by Minsky seems to be that banks are intrinsically speculators. But this can be challenged on his own grounds, because most deposits have no maturity date and, more generally, because banks are a type of firm that rests on the insurance principle of a pooling of risks. It might be argued then that banks lead to greater safety than would be present without them. Doesn't this view at least deserve an answer?

Further doubts about the independence of Minsky's arguments from the precise institutional arrangements arise for several reasons. Assume, for example, circumstances where every financial intermediary automatically has heavy access to the lender of last resort, much like the situation in certain capitalist countries such as Japan, France, and some of the Scandinavian ones. To what extent would Minsky's reasoning still apply? Imagine, also, a capitalist environment where bank deposits constitute the bulk of financial assets held outside the banking system (where the banks, in turn, possibly hold a large proportion of quoted securities). Once again, to what extent would Minsky's reasoning apply?

In sum, a financial-fragility argument is one thing; the application of the argument to all capitalist countries is another. Minsky skips over this

distinction with his appeal to formal classifications, test examples, and his general pronouncements about capitalism, including an occasional reference to "the Federal Reserve" as a generic term. If he, or anyone else, would only fully specify any one financial-fragility model with plausible application somewhere, perhaps we could think more clearly about the potential scope of the argument. As things now stand, we are in the dark about such elementary questions as whether or not destabilizing expectations are necessary in his argument, to what extent differences in relative speeds of adjustment in different markets are essential for him, and whether or not he requires asymmetric behavior by lenders and borrowers. Are we then in a position even to discuss the general application of his thesis to all capitalist economies?