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The Financial Instability Hypothesis: The Behavior of a Sophisticated Capitalist Economy

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THE FINANCIAL INSTABILITY HYPOTHESIS: THE BEHAVIOR OF A SOPHISTICATED CAPITALIST ECONOMY

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Introduction

The financial instability hypothesis is a theory of the behavior of a capitalst economy that is sophisticated in its financial usages. This theory leads to the conclusion that economic instability, as exemplified by financial crises and business cycles that encompass inflationary booms and deep and prolonged depressions, results from the normal functioning of such a capitalist economy. Instability of financial markets (the periodic crunches, squeezes and debacles), inflationary booms, and deep and prolonged depressions are observations; they occur. Neither sophisticated instruments nor complicated econometrics are required to observe the phenomena. The theory shows that instability is a result of the normal functioning of a capitalist economy.(1)

The financial instability hypothesis is a variant of post-Keynesian economics in two senses.(2) The first is that it uses the insights and analytical constructs of Keynes which shown that in a capitalist economy the behavior of relative prices, production, consumption, and employment (the real aspects) cannot be explained without taking into account the way investment and the ownership of assets are financed (the monetary aspects.)(3) The second is that it rejects the dominant interpretation of Keynes which ignores the dynamic aspects of Keynes's thought by forcing the analysis into the timeless framework used in standard (Walrasian) economic theory. Furthermore, as recent experience amply illustrates, the standard economics of today, which is usually labeled the neo-classical synthesis, is an inadequate framework for understanding the economy and a poor foundation on which to base economic policy.(4)

An implication of the financial instability hypothesis is that the stability properties of a capitalist economy vary with the structure of financial relations and the composition of

aggregate demand: the stability properties evolve as an economy moves through history. It follows from this evolutionary perspective that the efficacy of particular regimes of economic policy will vary with the immunity or susceptibility of the economy to financial instability. In particular economic policies that use the neo-classical synthesis as their analytical base cannot effectively guide the economy once the conditions conducive to financial instability exist. Whereas, quite by accident, the policy prescriptions derived from the neo-classical synthesis are "not bad" for an economy where the financial structure is "inhospitable" to financial crises.[11] The standard interpretation of Keynes has always been of questionable legitimacy. Professor Viner's brilliant review of The General Theory which appeared in 1937 laid the foundations for today's standard interpretation.(5) Professor Viner's review prompted a forceful rebuttal by Keynes(6) The financial instability hypothesis uses the argument of Keynes's rebuttal as a "pony", or guide, to interpreting The General Theory. The General Theory is interpreted as laying the ground work for an investment theory of business cycles and a financial theory of investment.

In his review Viner indentified liquidity preference as a demand for money function in which velocity depends upon the interest rate. In the rebuttal Keynes denied the validity of Viner's interpretation and argued that money directly affects the price level of capital and financial assets rather than the price level of current output. In Keynes's view, money provides a yield in the form of insurance against the "felt uncertainties" that business men and households must face. Each asset provides a particular combination of quick cash (insurance) and future income. In an economy with private debts and contracts denomi-

nated in money, there will always be some subjective return from holding quick cash. The banking system supplies the quick cash (money and money substitutes), past financing and investment decisions yield the stock of financial and capital assets, and experience and future prospects yield the quasi-rents (or cash flows) that capital and financial assets are expected to yield. In financial markets profit expectations from using particular capital assets in production are combined with characteristics of capital and financial assets with respect to their convertibility into quick cash to generate a system of prices of capital and financial assets.

Therefore a capitalist economy is characterized by two sets of money prices. One set is of current output and the other is of capital and financial assets. The price level of capital and financial assets, including common stocks, depends upon current views of the size and assuredness of future profits and the value placed upon the insurance against uncertainty embodied in money. The price level of current output is based upon labor and material costs and mark-ups. The alignment of these two sets of prices, together with current conditions in financial markets, determines the pace of investment. In turn, investment determines income, employment and profits. Any economic theory which ignores the special role of monetary and financial institutions in determining the price of capital assets and the pace of investment ignores the central theoretical problem that the General Theory addressed and such a theory can have but limited relevance for an economy such as ours which is capitalist, uses expensive capital assets in production, and which has complex, sophisticated and ever-changing financial institutions and practices.

Profits are a central concern of the financial instability hypothesis. Profits are the gross incomes that are derived from the use of capital assets in production, they are cash flows that are available to validate the payment commitments on debts and the other financial instruments used in financing ownership of capital assets and investment, and they are the lure that motivates production and investment. An analysis due to Kalecki of how profits are related to investment, government deficits, the saving propensities of wage earners and the consumption propensities out of incomes derived from the use of assets is one of the foundations of the theory.(7) In a capitalist economy profits provide the linkage between the demand for capital-assets that results in investment and the cash flows that are needed to validate the financial instruments used by the owners of the stock of capital assets that were inherited from the past. Because the emphasis is upon profits, the financing of capital asset ownership, the financing of investments and the payment requirements imposed by the structure of financial arrangements, the financial instability hypothesis is explicitly a theory of the behavior of a capitalist economy; unlike standard economic theory it is of little relevance for a socialist economy.

II. Keynes's General Theory

Before the General Theory was published Keynes wrote a post-card to George Bernard Shaw in which he said "I believe myself to be writing a book on economic theory which will largely revolutionize . . . the way the world thinks about economic problems"(8). On the other hand, Gardner Ackly, who was first a member (1962-64) and then chairman (1964-68) of the "Keynesian" Presidents' Council of Economic Advisors during the Kennedy-Johnson era, holds "that Keynes work represents more an extension than a revolution of classical ideas . . ."(9).

If a successful text book, such as Ackley's can hold that Keynes was basically consistent with what is now called the neo-classical synthesis then Keynes certainly did not "revolutionize the way the world thinks about economic problems". In this view Keynes ~~modified theory and~~ changed the capitalist world's perceptions of how economic policy can be used to make a capitalist economy work better but did not cause a Copernican shift in economic theory.

During the twenty years leading up to the middle 1960's, capitalism in the United States and throughout the world did "work better" than it had at other times. In part this better performance reflected ~~the absorption into the logical basis for~~ policy ideas that were drawn from Keynes. However what was taken into the body of current theory is the aspect of Keynes that is least disturbing to classical economics. In the work of Samuelson, Modigliani, Friedman and Patinkin, Keynesian concepts are forced into molds that make them compatible with the "Benthamite" ~~philosophical~~ psychological base of neo-classical theory. Thus largely due to the work of Friedman(10) and Modigliani(11), the behavior of consumption in today's theory is the result of how rational Benthamite households react to either fluctuating (permanent and transitory) components of income (Friedman) or to the "life

cycle" pattern of income and spending, whereas in Keynes (and Kalecki) the behavior of consumption is a "law" which states how the "surplus" is forced by institutions and the distribution of income. Thus in neo-classical theory the savings ratio is an independent determinant of system behavior whereas in Keynesian theory the savings ratio is system determined and reflects industrial structures, financing realtions, the compositions of demand, and political power.

Both Keynes's announcement to Shaw and Ackley's evaluation of Keynes are correct. The General Theory proposed a "research program" for revolutionizing economics but the program was never carried through; the revolution was aborted. Instead of a revolution certain surface aspects of the Keynes structure, mainly the treatment of the government as a demander of labor and a controller of disposable income, were integrated into the basic framework of the older theory. The neo-classical synthesis, which is represented as integrating Keynes and the classics, is more classical than Keynesian. The revolutionary insights of the General Theory were lost as today's standard theory was constructed.

Keynes General Theory was born out of the crisis of capitalism that was the Great Depression. The Great Depression is usually dated as having started in 1929. This depression was deep and long. In March of 1933 a complete collapse of the United States financial system took place. When the financial system of a Capitalist economy collapses, so do the normal modes of production and distribution. Questions posed by 1929-1933 are "How does the functioning of a financial system affect the behavior of a capitalist economy?" and "What can cause this financial system to collapse?"

Keynes General Theory is an attempt to answer these questions. His "revolution" was to construct a theory of the behavior of a capitalist economy. To put it quite simply, since Adam Smith economic theorizing has started from a"model" of units with initial "bundles of commodities" who then trade: the real world is to be understood by assuming it is like a Village Fair. Keynes changed the model - changed the "paradigm" to use a now popular word - so that the fundamental economic act is owning capital-assets and investing. By shifting the emphasis from trading to investing, he attempted to change the "place" from which economists viewed the economy to the Board Room of a business or a "bank".

One aspect in which the economics that Keynes tried to achieve and the economics of today differ follows immediately from the distinction between trading at a "Village Fair" and financing the ownership of capital-assets and investing on "Wall Street". A "day" at the Village Fair can be frozen in time, one can go back and forth from stand to stand and haggle and comparison shop. Owning and financing capital assets and investments are always acts in real, calendar time; decisions are taken which will bear fruit in the future and today's outputs and payments are the result of past decisions. With time in Keynes comes uncertainty - not as a 'peripheral' adjustment but as an essential fact of life which "conditions" decisions. The framework ~~within which units behave~~ is different in the two theories. The neo-classical world is one of certainty and certainty equivalents in which rational behavior is based upon sure knowledge of how the economy works. In Keynes the rational decision makers are aware of ~~the~~ basic uncertainty ~~that~~ goes with time and recognize that any theory ~~one may hold~~ of how the system works is at best a highly conditional hypothesis. Whereas the rational neo-classical man is a believer the rational Keynesian man is a skeptic

Keynes's General Theory, which is optimistic, was born in the climate of despair that followed the collapse of the financial system. The central theoretical problems taken up in The General Theory are "what determines asset values? and how do asset values affect investment under capitalist institutional arrangements?". One of the theorems that ~~came~~ comes out of Keynes' analysis was that the government could offset some of the ill effects of financial instability and fluctuations in investment by fiscal policy actions. This theorem was seized upon and integrated ~~integrated~~ into models of aggregate demand, even as the analysis of asset valuation and the elements making for instability were neglected. In this process Keynes' theory was vulgarized into a set of simple minded policy recommendations.

If we "date" events we can get an understanding of why the Keynesian revolution was aborted. The Great Depression's climactic event was the collapse of the United States financial system in 1933. The United States, and with it the rest of the capitalist world, began a struggling recovery after the spring of 1933, but the great depression had been so deep that by 1937 the recovery was only partial. During this long struggle up from the "pit" of the Great Depression many reforms were instituted in American capitalism. These reforms which were largely "in place" before the 1936 election, changed the way the financial system operated.

Keynes's General Theory was published in 1935/36. The major reviews appeared in 1936/37. Keynes's famous rebuttal to Viner, in which he tried to set things right, appeared in late 1937. In September of 1939 England was at War and the United States was at war in December 1941. The war ended in late 1945.

During war time the financial determinants of private investment are of minor or no import in determining system behavior. During war the behavior of the economic system is largely determined by the technical conditions of production and the efficacy of government administrators in constraining consumption and forcing the production of war material. In both the United States and Britain the newly developed National Income Accounting, the Keynesian definition of income, and the consumption function became tools of war planning. The same ingredients became the basis for the post war analysis of economic performance. The war time adaptation of some ideas that were consistent with part of The General Theory became the basis for post-war economic policy analysis. The "monster" econometric forecasting models that are so large on the United States and international scene today are the offsprings of the "physical" wartime planning models.

But the world did not stay "frozen" in the non financial war economy. The peculiar "robust" financial structure with which the United States emerged from the war became the transitory basis of a way of "working" capitalism in which financial markets were of little importance. World War II was followed by what we can call a Golden Age of Capitalism. During the years 1945-1966 there was no world wide depression and recessions were short and mild. These years saw an unprecedented increase and wide distribution of "material" means of living in the United States, Western Europe and Japan. This golden age of economic growth is a remarkable success story.

During this golden age the naive unsophisticated fiscal policy version of The General Theory served as an adequate basis of policy. However beginning with the credit crunch in 1966 the financial system and the economy began to "misbehave".

Four times since the mid-1960's the Federal Reserve System has had to intervene to abort a financial crisis: a big depression seemed imminent in 1974/75.

With the emergence of financial instability capitalism has begun to behave in its "normal" fashion. However the cash flow relations of welfare state capitalism are such that the result of instability has not been big depression but what is called stagflation. We now have an economy with continuing inflationary pressures which "lurches" back and forth between accelerating inflation and threats of a financial collapse and deep depression.

With the emergence of instability the Golden Age ended. Capitalism is once again behaving in the manner which brought forth Keynes's The General Theory. Thus we now need to pick up theorizing where Keynes left off in 1937 and resume the business that had been interrupted for more than 40 years: the business of both understanding capitalism and bringing it under control. The objective situation is such that a reconstruction of economic theory on the foundations laid down by Keynes more than forty years ago can now proceed.

III. A Statement of the Hypothesis

The financial instability hypothesis adds to what is explicit in Keynes an analysis of the consequences of liability structures that develop as positions in capital and financial assets and increments to the stock of capital assets are financed. The view of the economy is explicity from "Wall Street" or "The City". To an investment or commercial banker, the primary question in financing either current activity or the ownership of assets is "How is the borrower going to get the cash to meet the commitments on the contracts?"

To a banker economic activity generates cash flows. Profits (Keynes's quasi-rents) are the excess of cash receipts over those out of pocket costs of business that are required for production. Gross profits, net of taxes but inclusive of interest payments, are the cash flows that enable business to fulfill the commitments on debts. It is perhaps worth emphasizing that profits in what follows is the gross income after taxes due to capital-assets; it is not the profits of the "accountant". (12)

As has been argued Keynes's theory and the financial instability hypothesis are based upon a different set of questions and a different perspective than neo-classical theory. Neo-classical theory begins its "thinking" about the economy by setting up trading games in which households go from an initial commodities bundle to a preferred commodity bundle. This approach is a Village Fair perspective. The financial instability hypothesis begins by examining the financing of activity and the profitability of owning capital-assets. This approach is that of the board room, the perspective is of a banker. The economy is clearly capitalist.

In the Wall Street view the exchange of money today for money later is the key economic transaction. The money

today may involve exchanging money for a financial instrument, an exisisting capital asset, or investment output; the money tomorrow may be interest, dividends, repayment of principal or the gross profits after taxes from the use of capital assets in production. The Wall Street view cannot be static. If "yesterday's" debts and capital asset acquisitions are to be validated it will have to be by today's and "tomorrow's" cash flows. Furthermore the theory shows that "today's" (and "tomorrow's) cash flows are largely determined by investment which, in turn, is undertaken because business men and bankers expect their decisions to invest to be validated by future cash flows. Investment takes place today because business men and bankers expect investment to take place tomorrow.

The cash flows that validate debts and the prices paid for capital assets are profits. What determines profits in a capitalist economy? The neo-classical answer, which is that the technical marginal productivity of capital generates profits won't do in a world where output fluctuates and market power exists. Once a cyclical view of the economy is accepted, the production function construct as a determinant of either output or of relative factor remunerations becomes superfluous.

The existing system of short-run costs relations for the different outputs which reflect technical capabilities as embodied in capital assets and current input, largely labor costs,are the appropriate starting point for the analysis of profit flows. Thus the analysis begins with a set of functional relation between out-of-pocket costs and output. When cost curves are combined with market conditions, demand curves that vary with aggregate demand are translated into variations in gross profits. If gross profits are large enough, the debt structure and past investment decisions are validated.

This formalization shows that a capitalist economy only works well as an investing economy. Investment generates profits; profits by generating cash flows that can be used to repay debt make the issuance of debt possible; and expected profits affect the demand for investment output. Investment takes place because it is expected to yield profits in the future, but these profits will be forthcoming only if future investment takes place. Profits are the carrot and the stick tht make capitalism work.

Profits exist only if prices exceed unit labor and purchased input costs. The price system for current output allocates profits to particular productions. In the simple model, where government and foreign trade are not taken into account, prices and outputs adjust so that profits equals financed investment. The determination of relative prices and the scale of particular output takes place within an aggregate environment that is given by the need for profits to equal investment.

This theory of profit determination and the identification of profits as the flow from the income generatin system that is available for the fulfillment of business debt contracts is one ingredient to the financial instability view. This ingredient leads to the proposition that current investment, in the simple model where government and foreign trade do not loom large, determines whether or not the financial commitments on business debts can be fulfilled; in particular, at a sufficiently low level of investment, income and thus profits a significant proportion of the contractual commitments on business debts cannot be fulfilled. Fluctuations in investment determine whether or not debts are validated; the question that now has to be addressed is why does investment fluctuate.

If we assume, with Kalecki, that workers spend all they earn on consumption and profit receivers do not consumer, we get

1. $\pi = I$ (profits equal investment)

This is nothing more than a restatement of savings equals investment. However, Investment is a function of P_K, $P_I(I)$, $E\pi$, and Ext. Finance. (P_K = price of capital assets, $P_I(I)$ = supply price of investment goods as functions of the pace of investment, $E\pi$ = current and expected profits and Ext. Finance = external financing conditions).

Thus

1'. $I \longrightarrow \pi$

Investment calls the tune and cash flows and finance affect investment. It can readily be shown that

2. $\overset{*}{\pi} = I + Df$,

when Df is the government deficit and $\overset{*}{\pi}$ is after-tax profits. Furthermore,

3. $\overset{*}{\pi} = I + Df - BPDf$,

where BPDf is the deficit in the balance of payments. The model can also allow for consumption out of profits and savings by workers.

The important step in developing this model is the recognition of the different faces of profits in a capitalist economy. Realized "profits" in such an economy are: (1) the cash flows that may or may not validate debts and the prices that were paid in acquiring capital assets; (2) the mark-up on labor costs that assure that the workers producing consumer goods cannot purchase all of what they produce, (3) the signal whether accumulation should continue and

(4) the indication of where the surplus should be allocated.

To answer that question, we turn to the financial system and the debt structure. Any "position" (i.e. a set of owned financial or capital assets) needs to be financed. The instruments used to finance positions set up cash flow commitments even as the assets "in position" yield cash flows. We can distinguish three types of financial postures.[13]

1. Hedge finance: The cash flows from assets in position exceed the cash flow commitments on liabilities for every period. As cash in exceeds cash out in every period the value of a hedge finance unit is positive for every set of finite interest rates.

2. Speculative finance: The cash flows from assets in the near term fall short of the near-term contracted payments, but the income portion of the near-term cash flows exceeds the interest cost of the debt and the longer term cash receipts are expected to exceed the cash payments. A speculative finance unit needs to roll over or refinance debt to meet its near-term financial commitments. The present value of the net cash flows of a speculative finance unit will be positive for one set of (low) interest rates and negative for other (high) interest rates.

3. "Ponzi" finance: The cash flows from assets in the near-term fall short of the cash payment commitments and the income portion of the near-term receipts falls short of the interest portion of the payments. A "Ponzi" finance unit must increase its outstanding debt in order to meet its near term financial obligations. Presumably, there is a "bonanza" in the future which makes the present value positive. Although "Ponzi" finance is often tinged with fraud, ~~every~~ investment project with a long gestation period and a somewhat uncertain return have aspects of "Ponzi" finance.[14] Furthermore the finances of corporations which are currently making losses but that expect (hope) that the situation will turn around have "Ponzi" finance attributes.

If we write CCC_i as the contractual cash payment commitments on debts, $\bar{Q}$ as the expected ~~quasi-rents~~ profits or cash receipts from contract fulfillment and $\sigma^2_{\bar{Q}_i}$, as the variance of the expected cash flows $\bar{Q}_i$, all for the ith period, then we can state the expected cash flow relations at any date as an inequality or equality between CCC_i and $\bar{Q}_i + \lambda\sigma^2_{\bar{Q}_i}$. The "$\lambda$" reflects the margin of safety in the cash flow relations that "bankers" require. The expected value of cash receipts to $\bar{Q}_i$ and the variance $\sigma^2_{\bar{Q}_i}$ are parameters of a subjective frequency distribution. This formalization is designed to elucidate the cash flow relations. Any econometric work based upon this ~~formalization~~ will have to come to grips with how the expected quasi-rents $\bar{Q}_i$ and their variance $\sigma^2_{\bar{Q}_i}$ are to be estimated from historical data.

For a hedge unit the cash flow relation can be stated as

1. $CCC_i < \bar{Q}_i - \lambda\sigma^2$ $\quad i = 1, \ldots \infty$ where λ reflects the "margins of safety" to offset "borrowers and lenders" risks of which both Keynes and Kalecki wrote. Inasmuch as the borrower views the CCC_i's as "almost certain" and the Q_i as performance determined and the lender wants protection against default by having a margin of safety between $\bar{Q}_i$ and the CCC_i, we assume that there is a large enough λ which makes the capitalization rate on the cash payment commitments CCC and the adjusted expected quasi-rents $\bar{Q}_i - \lambda\sigma^2_{\bar{Q}_i}$ the same. Let us write this capitalization rate $K(r)$, so for a hedge unit we have

1a. $K(r)\,(\bar{Q}_i - \lambda\sigma^2_{\bar{Q}_i} - CCC_i) > 0$ for all r., i = 1 --- n.

For a speculative unit the cash flow relations are

2a. $CCC_i > \bar{Q}_i - \lambda\sigma^2_{\bar{Q}_i}$ $\quad i = 1, --, n.$

2b. $CCC_i < \bar{Q}_i - \lambda\sigma^2_{\bar{Q}_i}$ $\quad i = n + 1, ---, \infty$

Furthermore, if we divide the CCC_i into the interest ~~+~~ dividends or rent~~+~~ payment $CCC(int)$ and the repayment of the principal amount of the debt $CCC_i(prin)$ and if we divide the $\overline{Q}_i$ into the expected net income $Q_i(inc)$ and the expected capital consumption $Q_i(Cap\ Cons)$ then

$$CCC_i = CCC_i(int) + CCC_i(prin) \quad i = 1 -- \infty$$

$$\overline{Q}_i = Q_i(inc) + Q_i(Cap\ Cons); \quad i = 1 -- \infty$$

so that a speculative unit is characterized by

2c. $CCC_i(int) \leqslant Q_i(inc)$ $\quad i = 1 -- n$

2d. $CCC_i(prin) > Q_i(Cap\ Cons)$ $\quad i = 1 -- n$

2e. $CCC(int) < Q_i(inc)$ $\quad i = n + 1 --, \infty$

2f. $CCC(prin) \leqslant Q_i(Cap\ Cons)$ $\quad i = n + 1 -- \infty$

If once again we fix λ so that the same capitalization rates can be applied to both the contractual cash commitments and the quasi-rents we have

2e. $K(r)\,(Q_i - \lambda\sigma^2_{\overline{Q}_i} - CCC_i) \gtrless 0$ $\quad i = 1 -- \infty$ for $r \overset{<}{=} \rho$

$K(r)\,(Q_i - \lambda\sigma^2_{\overline{Q}_i} - CCC) < 0$ $\quad i = 1 -- \infty$ for $r > \rho$

That is the present value of the receipts and payment streams is positive for low and negative for high interest rates.

For a Ponzi finance unit we have

3a. $CCC_i > Q_i - \lambda\sigma^2_{\overline{Q}_i}$ $\quad i = 1 -- n$

3b. $CCC_i < Q_i - \lambda\sigma^2_{\overline{Q}_i}$ $\quad i = n + 1$

The cash outflow exceeds the cash inflow at every period but the final period when the project matures and a "pot of gold" is received. Furthermore in the income flows we have

3c. $CCC(int) > Q(inc)$ $\quad i = 1 -- n$

3d. $CCC(int) < Q(inc)$ $\quad i = n + 1$

Because of 3a and c the outstanding debt increases over periods 1 -- n. If once again λ is taken to be so large that the capitalization rate to convert the CCC's and the Q's into present value is the same we have

3e. $K(r)\ (\bar{Q}_i - \lambda\sigma^2_{Q_i} - CCC_i) \geq 0 \quad r \leq p$

$K(r)\ (\bar{Q}_i - \lambda\sigma^2_{Q_i} - CCC_i) < 0 \quad r > p.$

For a unit that is investing in capital assets the capital asset specific relations can be divided into two parts: (r_s = short term interest rates and r_l = long term interest rates)

$$P_I = K(r_s)\ (CCC_i) \qquad i = 1, --, n$$

$$P_k = K(r_l)\ (\bar{Q}_i - \lambda\sigma^2_{Q_i}) \qquad i = n+1, -- \infty$$

The CCC_i proceed the Q_i for the CCC are the cumulating costs of producing the investment output and the Q_i are the quasi-rents that the capital assets will earn as they go "on stream" on the nth day.

At the date $i < n$:

$\frac{\partial P_I}{\partial r_s} > 0$ and $\frac{\partial P_k}{\partial r_l} < 0$. Thus there is a scissors effect on investment projects due to rising interest rates: The costs of investment output rises even as the present value of the capital-asset falls.

It is also to be noted that a speculative unit can become a Ponzi unit as "refinancing" takes place if the CCC_i need reflect higher interest rates. A hedge unit can become a speculative unit if the quasi-rents fall or if the cash payments due (the CCC_i) on debts rise either because interest rates increase or "tight money" leads to a shortening of the term to maturity or of the amortization schedule on debts.

External finance and interest "rates" enter the investment process at two quite different stages. The production of real investment takes time and the early-on costs are compounded at the short-term interest rate in determining the sales or offer price of investment output. This is beautifully illustrated in the way construction is financed in the United States. The financing of a construction project involves the drawing down of funds at a bank; obviously, the sales or offer price provides for the recovery of the principal and the interest charges on those funds. An investment good, once delivered and "at work" in a production process, is a capital asset. As a capital asset, its value is the present value of the gross profits after taxes that are imputed to its participation in economic activity: the present value is inversely

related to the discount rate and positively related to the expected gross profits.

An investment project with a significant time to completion can be considered as a commitment to make payments at particular dates for both labor and the purchased components. The "credit" or "borrowing" embodied in the project accumulate as the project proceeds from its initial design stage until it is ready to start up. Thus each particular project gives rise to a rising and increasingly inelastic demand for financing as it proceeds to its completion. An investment boom - whether it is a boom in construction, the production of durable consumer goods or inventory accumulation - leads to a rising and inelastic demand for credit.

If the supply curve of finance is infinitely elastic, then finance doesn't serve to constrain investment. As higher investment leads to higher profits, there are strong incentives for further increases in investment. This recursive process leads to an inflationary investment boom. In time either the internal workings of the banking mechanism or Central Bank action to constrain inflation will result in the supply of finance becoming less than infinitely elastic, perhaps even approach zero elasticity. The combination of a rising inelastic demand curve for finance and an inelastic supply curve of finance implies that short-term interest rates increase rapidly.

Sharp increases in the short-term interest rate raise the prices at which producers of investment goods recapture their costs. Sharp increases in short-term interest rates lead to a rise in long-term interest rates, which lead to a fall in the present value of the quasi-rents that investments will yield once they become capital assets. Rising short term interest rates shift the supply price of investment upward even

as the rising long term interest rates shifts the demand price for investment, which is derived from the price of capital assets, downward. This "scissors" will lead to a fall in investment, which lowers profits. A decline in profits leads to a decrease in the margins of safety between the payment commitments on debts and the profit cash flows of firms. Higher interest rates and a decline in profits will shift some firms from being hedge to being speculative, from being speculative to being Ponzi. For some Ponzi units the prospect of a "pot of gold" at the end of the cash flow deficits that is large enough to offset the now greater deficits becomes dim or vanishes.

A recursive process in which the decline of investment leads to cash flow problems which lead to further declines of investment can continue even on to an epidemic of "present value reversals" in which the supply price of investment output lies above the demand price for capital assets for a broad range of normal investments. When this happens investment and, with investment, profits collapse. Once profits collapse, the cash flows to validate even initially hedge financing arrangements will not be forthcoming. Financial crises will be part of this recursive process. Wide scale present value reversals are a key step in the generation of deep and prolonged depressions and a gradual "reversal of the reversals" characterizes the recovery from deep depressions.

The essence of the financial instability hypothesis is that financial trauma occur as normal functioning events in a capitalist economy. This does not mean that a capitalist economy is always tottering on the brink of disaster. There are situations where hedge financing is dominant; such robust financial markets are not readily susceptible to debt

deflation processes. There are also fragile financial structures in which speculative and Ponzi finance looms large. The normal functioning of an economy with a robust financial structure is both tranquil and, on the whole successful. The first two decades after World War II can be characterized as possessing a robust financial system and these were golden years as measured by employment, price stability and growth of gross national product. Tranquility and success induce increases in capital asset prices relative to current output prices and a rise in (1) acceptable debts for any prospective income flow, (2) investment and (3) profits. These concurrent increases lead to a transformation over time of an initially robust financial structure. Once a financial structure includes a sufficient weight of speculative finance and "Ponzi" finance, such as the interim financing of investment, then a run-up of short-term interest rates, when the demand for short-term financing increases rapidly as during an investment boom, will lead to present value reversals in which the cost of some investment outputs becomes greater than the value of capital assets being produced. In these conditions the take-out financing will not be forthcoming. This leads to another round of declining asset values, so that additional capital asset values fall below the supply price of investment output. This leads to a further decrease in investment. But decreases in investment, by decreasing profits, makes things worse. The market reactions set in motion by a decline in income in the context of a financial structure that is heavily weighted by Ponzi and speculative finance makes things worse: the underlying markets are unstable.

The above exposition of the emergence of a financial crisis does not rely upon changing expectations or changing views about uncertainties in order to generate the present value reversal and the threat of a financial crisis. During the expansion phase each increase in investment increases profits. Higher profits makes the carrying of debt easier - cash flows are increased when investment increases. Increased internal financing becomes available when profits rise above anticipated levels. The past success of the enterprize, as measured by profits achieved, indicates that this increase in profits should be "levered" so that future profits can increase.

Stability is destabilizing, not initially to a recession but first to an investment expansion and prosperity. The endogenous determination of financing structure as a reflection of the past behavior of the economy means that the financial structure becomes more susceptible to a financial crises even as business men and bankers extrapolate the success in fulfilling financial commitments into a diminished likelihood that a financial crisis will occur.

The business cycle theory that follows from the insights of Keynes and Kalecki, once some detail about the functioning of sophiticated and complex financial system is added, is not based upon any irrational behavior on the part of business men or bankers, or on any swing between an unwarranted euphoria and psychopatic pessimism. It is the world that is irrational (nay uncertain) not the bankers and business men.

However in the world as it is there are swings of euphoria and pessimism. These exacerbate but do not cause business cycles.

IV. The generation of profits

There is no need to repeat the demonstration that Gross Profits = Gross Investment once particular behavioral relations are assumed. These behavioral relations can be relaxed, so that Gross Profits Net of Taxes = Gross Investment + Export Surplus + Budget Deficit - Workers' Savings + Capitalists' Consumption can be shown to hold.(15) These Kalecki relations, in which profits are generated by the way the economic system works in terms of investment, government size and scope, foreign balance, the consumption habits or workers, and the distribution and use of profits, link the income generating process under capitalism to the cash flows embodied in the financial structure.

This is so because Gross Profits after Taxes are the realized Q's that enable cash payment commitments, the CCC, of firms that use debt to finance control over capital-assets, to be satisfied. Whereas current profits determine whether units can fulfill their financial commitments, anticipated profits determine the willingness of bankers and business men to extend and to take on financial commitments.

In the capitalist economies that existed prior to the 1930's 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 (with small government gross profits net of taxes were approximately equal to gross profits). Thus a decline in investment led to a fall in gross profits, which could transform hedge into speculative units, and speculative units with $Q(inc) > CCC(inc)$ into units with $CCC(inc) > Q(inc)$ even as it made the net worth of units smaller than hitherto.

Such changes in balance sheet relations, along with the transformation of a decline in current profits into a decline in anticipated profits, lowers 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 is possible in such a small government capitalism.

If on the other hand government is "big" then a fall in investment not only leads to a fall in income, employment and profits but it also leads to a substantial rise in the government deficits. How big the deficit becomes and how rapidly it increases depends upon the structure of the tax system and the nature of the government spending programs. In a "modern" welfare state the retirement, unemployment insurance, and other income maintenance schemes are usually such that expenditures rise rapidly with unemployment. Furthermore income, social security and value added taxes mean that a rapid decline in government revenues takes place when income and output fall. Even excluding the discretionary expansionary effect of "new" progreams or program " improvements" adopted in a recession, 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 1974/75 the government deficit exploded to a more than $100 billion annual rate 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 which continued for at least 15 quarters (through QII 1979, when this is being written) started in 1975 III.

Big government is a powerful stabilizer of income and employment, not only because of the impact on employment but also because of the relation between business profits and the government deficit.

The other items in the extended Kalecki formula for profits are also important determinants of system behavior and help explain business cycle experience. Note that the export surplus shows up as positively related to profits. If there is an "income" effect upon imports so that imports decline with income then an economy that is in an "isolated" recession will see profits sustained by an increase in its export surplus (or a decrease in its deficit). When a country expands its budget deficit and this expansion raises imports, then it operates to increase both domestic profits and profits of its trading partners. Thus 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, then a decline in income and employment may be amplified as employed workers cut down on debt financed spending. This increases workers savings and tends to decrease profits. On the other hand the evidence indicates that once unemployment stops rising workers who experienced no or little unemployment increase their purchases of debt financed consumer goods; this diminishes worker savings and increases income, employment and profits.

It is clear that for any structure of payment commitments relative to profit flows, an economy with a big government that automatically has large deficits whenever employment falls is less susceptible to big depressions and its financial system is more robust than an economy with a similar liability structure that has a small government. Big government stabilizes an economy against "downward" pressures on income and employment in three ways: One route is by way of income and disposable income, which in turn leads to employment, another is by way of the deficit which sustains profits and the third is by the default free debt that banks, financial institutions, firms and households acquire when government finances a deficit. Such default free debt sustains bankers' monetary liabilities and provides "financial" resources that will sustain an expansion once the decline is halted in the face of central bank constraint.

The sky did not fall in 1975, as many feared it might, because big government deficits sustained profits. This is not the entire story--but it is the important element in the tale that is neglected in the conventional analysis.

There is an ambiguity in the Kalecki formulation of the determination of profits. Whereas the mass of profits in consumption goods production is determined by the condition that profits in the production of consumer goods equals 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. Of course total profits equals profits in the production of consumption goods plus profits in the production of investment goods ($\pi = \pi_C + \pi_I$) and 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 equals investment output ($I = \pi_C + \pi_I$ for $\pi_C = W_I N_I$). However all this says is that profits in investment goods production are what they are. In order to determine profits in the investment goods industries it is necessary to refer to the supply conditions of investment output.

A large part of investment goods, almost by their nature, are "unique" items tailor-made to the specification of the purchase. This is not a necessary attribute, except for the construction or plant portion of investment output, but it is an empirical generalization.

Furthermore investment goods output is often characterized by significant gestation periods and thus by a tying up of liquid financial resources in work in process. These liquid financial resources may be those of the investment goods producers or they may be "borrowed funds" from a bank. In any case an explicit contractual or an implicit opportunity cost "interest charge" on the costs of labor and materials involved in the production of investment goods must be included in the price of the output.

Bankers lend on a margin of safety. Thus the expected sales proceeds from the production of investment goods need exceed the costs of production of the investment good, including the interest charges on the borrowed or own funds tied up over the gestation period of the investment good, by some amount. If the project is successful this bankers margin leads to a mark up on costs or a profit rate that exceeds the bankers interest charges by a goodly ratio. For example if the interest charge is 10% and the banker allows for a potential cost overrun and price disappointment of 10% to 15% of the costs tied up in the project as it reaches fulfillment, then the profit rate on anticipated costs of the project will run to 20% to 25% of the value of the purchased labor and other inputs. Thus the "bankers" desire or need for protection leads to a supply price of investment goods that exceeds by some goodly margin the running costs (excluding interest) of production: mark up pricing is the result of the conditions bankers impose when they finance projects.

In order to complete the story of profit determination in investment goods production the demand conditions for investment goods need to be derived. Once again banking and finance enters into the process in an essential manner. Debts to banks, and other financial institutions and to the "open market", are used by firms to finance positions in capital assets, just as households and firms use debts to finance positions in common shares. The essential Keynesian ideas underlying liquidity preference can be interpreted as a market view, depending upon expectations and past experience, of the appropriate liability structure for the financing of positions in debt. When Temin[16/] notes that the risk differentials among classes of bonds increased

during the great contraction he was observing a change in the market view of the appropriate liability structure for debt financing of positions.

The terms upon which finance is available for the holding of capital assets helps determine the "market price" of capital assets. The asset preferences of households yields a financing structure for business, which is a "proximate" determinant of the price, in the market, for the capital assets that yield quasi-rents. Keynesian theory quite clearly is a two price level theory--one for capital assets and the second for current output. The link between the two is the way in which the price of capital-assets becomes the demand price for investment. Financial market conditions enter into the determination of the price and quantity of investment goods production 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 terms upon which positions in these capital assets can be financed.

In modern capitalist economies firms with market power presumably have offer prices which involve a predetermined mark up on out-of-pocket costs. As the above argument indicates, mark up pricing is a natural outcome of the banker's OR finance officer's contribution to the economic process. Firms without market power earn a mark up on out-of-pocket costs only if demand is "strong", i.e. only if aggregate investment is positive and 'large'. Presumably such "price-takers" would produce an unchanging amount of output even if demand price just equaled out-of-pocket

costs.[17]

In the simple case output is determined by the conditions that the sum of profits equals investment dmeand that is financed. The financed investment demand yields the wage bill in investment output, which in turn has to be reflected in the realized mark ups over wage costs in the production of consumer goods. How this mark up is distributed among fixed mark up and flexible mark up outputs depends upon the preferences of wage earners and other purchasers of consumer goods.

Therefore in a capitalist economy prices, outputs, and employment are determined by the condition that profits equals investment (with all the modifications necessary to allow for the expanded profit formula). Investment that takes place depends upon the investment that is financed. Investment that is financed depends upon the relation between the demand price for investment output and the supply price of investment output. The demand price of investment output is derived from the market price of capital assets. The market price of capital assets depends upon those relations which Keynes identified under the rubric of liquidity preference, one of which is the liability structure that are "acceptable" for the financing of positions in capital

assets. All other things being the same the "easier" the financing conditions in terms of the cash flow characteristics (hedge, speculative, Ponzi) the higher the prices 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 upon which bankers--broadly defined to include commercial, investment, merchant, and what have you--finance positions in capital assets and the production of investment output are critical determinants of system behavior. Such financing directly determines profits and thus whether or not current income validates the liability structure.

processes.

It is clear from the analysis of portfolio choices under tranquil conditions in an economy with a turbulent past, the profit equation of banks,[19] and the profit opportunities from holding levered capital assets for income or appreciation, that an initial condition which is dominated by hedge financing is unstable. In an economy dominated by hedge finance, there are profit opportunities in shifting towards a larger mix of speculative arrangements in the financing of positions in financial and capital assets because the supply conditions for short term finance lead to lower cost of money for those who can qualify for and use short term finance. A rise in the mix of speculative finance in the totality of financial relations increases the demand and thus the price of capital assets. This leads to a rise in investment demand, investment that is financed, and profits. In the aggregate a shift to speculative finance increases profits which validates the decisions of those who "lent" and those who "borrowed" to engage in speculative finance.[20]

Banks, and other financial intermediaries are both lenders and borrowers. As lenders--especially lenders on short term--they induce speculative finance in others. As borrowers,

they view "idle" hoards of cash as the raw material for expanding loans and they develop liabilities which enable those who would otherwise hold cash to dispense with cash. Because in this process banks stand ready to furnish cash to two sets of clients--their borrowers and their lenders--banks need to have secure means for acquiring cash at their own initiative. In the theory of banking such assets are often called secondary reserves, but in a world where banks are active profit making institutions, who operate on both assets and liabilities, the instruments, whether an increase in liabilities or a sale of assets, that are used to acquire cash when needed are the "position making" instruments. The cash manager of a modern corporation or a bank has a variety of position making instruments and actively juggles short term debts and assets among a range of such instruments.

For an instrument to qualify as an effective position making instrument it is necessary that sizeable transactions can be executed that use this instrument without generating large changes in the price of the terms of the instrument. The market for the instrument must be broad: there must be many buyers and sellers and in many cases there is a residual market maker. The residual market maker is usually--but not necessarily--the central bank.[21/]

The fact that some assets and liabilities can be classified as position making instruments means that other assets and liabilities are not "good" generators of cash at the initiative

of the "money position" manager. This means that if market positions develop in which the manager of the cash position of a corporation or bank is forced to try and raise cash by selling out such assets or issuing such liabilities, the cash generated by such sales or by such liabilities can fall short of "anticipated". In particular a wide attempt to make position by selling an asset which is not usually used for position making, such as happened in 1966 when banks tried to make position by selling municipal bonds, can lead to a large fall in the market price of such assets. Such an attempt "to make position by selling out positions" characterized the rapid stock market decline in 1929 and the sales of foreclosed real estate in the years of the great depression. The R.E.I.T.'s difficulties in the 1974/75 period were due to the inability of the assets in position to generate cash when the R.E.I.T.'s ability to sell commercial paper on the open market deteriorated.

Two elements therefore characterize the shift of a financial system from a structure that is inhospitable to financial crises to a structure that is conducive to financial crises: one is an increasing weight of speculative finance in the total financial structure and the second, which is a correlative of the first, ever greater dependence of banks, financial institutions and ordinary businesses upon their ability to "make position" by the sale of their liabilities rather than by the use of money or liquid financial assets.

The flow of funds data prepared by the Federal Reserve [22/] yields ample evidence that the weight of short term and therefore presumptively speculative finance in the total financial structure

of non-financial 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 the non-financial business sector has 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 that is 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 non-financial business. The greater the need of units to manage their liabilities the greater the susceptibility of the system to financial failures. Thus the shift to a financial structure conducive to financial crises is consistent with the profit opportunities from managing financial assets and debts that exist in a regime of robust, predominantly hedge, finance and is borne out by both the "numbers" and by "chronicles". 23/

An investment project is like a contract to make payments along a more or less precisely defined time table. Although not all investment is as large scale and complex as a "nuclear power plant", the construction and assemblage of a

nuclear power plant can serve as a "model" of an investment project. A large scale--or even an ordinary human scale--investment project involves the on the "site" construction and assemblage of components in a relatively well defined sequence as well as a "coordinated" production of components that will 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 an increase in the volume and complexity of financial relations. 24/

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

The cash flow relations in investment in progress makes "Ponzi finance" an essential and not a peripheral characteristic of the financial structure of capitalism. The cost of investment output that is produced and which 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.

The upper turning point is a completely endogenous affair 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 an investment boom takes place in a financial structure that is heavily weighted by speculative finance. Under these circumstances the rise in interest rates will cause "present value reversals" in that the present value of some Ponzi financed investment in process will change from being positive to being negative. A similar reversal happens for some units that are "into" speculative finance that are not financing investment. Furthermore the rise in interest rates leads to a decline in the value of firms, even for firms that are engaged in hedge finance. Such decreases in the margin of safety lowers the "credit" standing of firms. This leads to increases in specific financing terms above the rates typically chronicled by the time series.

A rise in the cost of investment projects above the expected value of the completed investment good as a capital asset leads to both a decrease in new investment undertakings and a failure of ongoing investment projects to acquire cash needed to fulfill projects. An inability of units engaged in speculative and Ponzi finance to refinance their position means that cash receipts due to financial assets owned by banks and other financial institutions fall short of what is stated in their contracts. Such units now have to acquire cash by either issuing new liabilities or selling assets, meanwhile the units faced with a drying up of financing trv to "stay affloat" selling assets to raise funds. Under these circumstances the prices of assets that are being used in an attempt to make position

fall and the terms on liabilities that are offered in the market to make position increase.

The drying up of finance and the cash shortages which decrease investment cuts profits. The realized quasi rents fall below anticipated quasi rents. The fall in profit flows leads to a further decline in the present value of firms and even erstwhile hedge units can 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 experiment with speculative financial arrangements and to economize on holdings of money and protected financial assets. The only way interest rates cannot rise during an investment boom is for the supply of finance to be infinitely elastic--which either implies that a flood of financial innovation are taking place [25] or for the central bank (or rather the central banks of the world) to supply reserve deposits to banks in unlimited amounts. But this implies that investment is an ever increasing proportion of output and that accelerating inflation is tolerable.

Although endogenous market processes lead to an incipient financial crisis and the upper turning point, the extent of the financial crisis and whether a debt deflation process takes place depends upon how quickly and aptly the central bank's intervenes as a lender of last resort and whether government quickly and aptly steps in to stabilize profits. The 1974/75 experience, where the sky was not allowed to fall because the

prompt lender of last resort intervention by the Federal Reserve and the giant banks, which refinanced the walking bankrupt Real Estates Investment Trust, allowed the profit generating effects of the massive 1975 government deficit to take hold, is an example of a quick and high turning point. The 1929/33 experience where the Federal Reserve dithered and government tried to balance its budget is an example of a delayed and low 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.

VI. The lender of last resort

In a capitalist economy with a complex, sophisticated and responsive financial system the dynamics introduced by profit seeking into balance sheet structures of banks, financial institutions, business organizations and households assures that a run of good times will be accompanied by an increase in the importance of position making activity as well as changes in the instruments and markets that are used. The passive management of liability structures by financial organizations, businesses and households that characterizes a highly liquid financial structure that is dominated by hedge finance is a transitory state that follows either a deep and prolonged depression brought on by a debt deflation or a large increase in government debt that follows a great war. Active liability management means that a modest shortfall of cash from operations or a rise in the 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 mainly carried out by means of operations in Treasury Bills. Under these circumstances any rise in the need by banks or others to raise cash by means of a sale of Treasury Bills was quite quickly met by an infusion of Federal Reserve credit, either directly through an open market operation or indirectly through the support of the carrying capacity of "Bond" dealers by means of loans at the discount window. The Federal Reserve prized orderly conditions in Treasury debt markets and by doing so remained in close and continuous contact with the money market. Position making during these years took place by means of operations in a market that was protected by the Federal Reserve. Furthermore because the Federal Reserve was operating in the Treasury Security market both as fiscal agent for the government and in its effort to control or steer the economy, the Federal Reserve was in constant contact with the position making market as an active participant.

As position making became more a matter of liability management than a matter of dealing in Treasury debt the Federal Reserve lost its day to day contact with the markets in which positions were made and the position making instruments were no longer "protected" by the Federal Reserves. 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 led to an active exploration by units needing cash of "new" or "exotic" sources of cash. Complex convoluted procedures were adopted and markets for new instruments grew rapidly. Inasmuch as these markets were "exposed" to rapid fluctuations and they lacked central bank protection, the situation became conducive for a "local failure" to be

transformed into a sharp rise in terms and restrictions on availability in these markets.

Thus with the development of closely articulated cash management towards the end of the 1950's, 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 it seems to have missed the significance of the evolutionary changes that were taking place. In the closely articulated cash management situation which developed, not unusual events triggered serious financial market disruptions in 1966, 1969/70, 1974/75 and 1978. In each case the Federal Reserve was forced to intervene to protect the viability of the financial system. In each of these cases the Federal Reserve acted as a lender of last resort by supplying emergency cash or by promising to make cash available when needed.

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 the position making instruments. The second is the restructuring of the finances of various organizations in the aftermath of a "crisis" in which emergency funds are provided so that the weight of Ponzi and speculative finance in the total financial structure 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.[26]

When the price of the assets 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 hypothication of other assets. Thus asset prices can fall rapidly and across a wide spectrum of assets as organizations try to make position by selling out positions. But once this spreads and balance sheets are evaluated by lenders on the base of market rather than historic values of assets, the ability to borrow, and even the solvency, of many institutions is impaired. The central bank has a responsibility to prevent such a generalized fall in asset values by providing funds for position making through "conventional" assets or by extending "credit" to cash short organizations. The central banks primary responsibility with respect to price levels is to assure that asset values are sufficiently high so that insolvency is always a local not a general condition; in particular the central bank's lender of last resort function aims to assure that a generalized fall in capital-asset values will not occur because such assets are offered for sale by units that need cash to make position.

Thus it is quite clear that 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 the weight of speculative and Ponzi finance in the structure of financial relations breaks there will be business organizations whose longer term profit (quasi-rent) expectations can support a long term debt structure at normal interest rates which are unable to validate, through cash flows and refinancing at boom or crisis financing terms, a debt structure that is 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 leads to financial structures which, in combination with the way in which investment is financed and the effect of investment on the ability of business to validate debts, 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 that it promotes or by its operations, so that the actual and potential weight of speculative and Ponzi finance is 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, are examples of financial reforms that diminish the potential for instability by erecting barriers to speculative and Ponzi finance. It can be argued that 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 is slowed, if not reversed. In particular, the Franklin National crisis of 1974/75 indicated that postive steps to control and constrain the offshore banking community was necessary. The Federal Reserve and other central banks did little or nothing to constrain the further expansion of offshore speculative financial relations in the aftermath of the Franklin National crisis.

VII. Policy Implications

The financial instability hypothesis shows that capitalism is inherently and inescapably flawed because the normal functioning of the markets in which the financing of investment and positions in capital-assets take place leads to conditions that are conducive to financial crises and thus to deep depressions. The financial instability hypothesis also shows that even though the processes that lead to financial crises and deep depressions are fundamental to capitalism the resolution of these processes - what actually happens in the economy - depends upon the institutional structure and policy interventions. Thus the instability of capitalism is a variable related to institutions and policies: All capitalisms are unstable but some capitalisms are more unstable.

The financial instability hypothesis thus leads to the conclusion that policy is important, especially when it is recognized that policy includes legislation that designs and provides for the control of institutions and usages. In terms of the relations emphasized in this paper institutions and policy will affect the time path of the economy as they affect the level, rates of change and assuredness of profits and the mix of hedge, speculative and Ponzi finance among the various economic units. In terms of relations not emphasized in this paper, but which nevertheless are integral to the full statement of the financial instability hypothesis, the path of the economy is affected by the institutions that determine the supply of labor, the determination of money wages, and the mix of oligopolistic and competitive pricing.

The development of big governments, with a structure of spending commitments and taxes so that a large deficit occurs whenever output and employment fall below some standard, and active government, with a welfare state thrust so that program

improvements take place whenever employment falls, means that in the years since 1946 the connection between a decline in investment and a fall in business profits has not been as close as in the century prior to 1939. Big government, by halting the reciprocating interaction between a decline in investment and a decline in profits, prevents the collapse of business cash-flows. As a result the widespread present value reversals that characterized the deep depressions of history no longer take place. With profits sustained businesses are able to validate their debts. As a result asset values cannot fall too far. It follows that some form of big government, which runs a large deficit when needed, is necessary if the financial flow relations that lead to and then characterize a deep depression are to be avoided. However the necessity of big government does not imply that the present big government, with its emphasis upon armaments and transfer payments, is necessary.

In the 1920's, in the United States shares of stocks listed on the New York and other exchanges were often purchased with as little as a 10% margin. Given that the interest rate on loans was greater than the dividend/price ratio of shares this stock exchange financing was a quite extreme form of Ponzi finance, for the excess of the cost of carrying shares over the dividends earned on shares was added to the debt. The only way the debt could be paid off with a profit to the shareholders was by the sale of the shares at an ever higher price.

In the 1930's the Federal Reserve was given the power to set margin requirements for holding shares. The Federal Reserve has since set these margin requirements at rates ranging from 50% to 100% of the purchase or market price. As a result the financing of stock exchange assets by debts is now

more of a speculative than a Ponzi financing relation, in that the income earned by the shares normally exceeds the carrying costs. Shares are still bought on margin on the expectation (hope?) that share prices will rise, but the ability to pay off the debt by the proceeds from the sale of shares no longer depends upon a rise in share prices.

In the 1920's, in the United States, the standard home mortgage was a five year contract that quite often, but not necessarily, was being amortized on a longer term - say 20 or 25 year - schedule. At the end of the short term of the mortgage a large balloon payment was to be made. At the time the five year contract was initiated both the lender and the borrower expected that the maturing debt would be "paid" by new debt. The mortgage contract was a form of speculative finance.

As a result of legislation in the 1930's which provided for government endorsement of mortgages and of deposits in savings institution the standard mortgage on single family homes, rental housing, and commercial property is now a fully amortized, long term (20 to 40 years), and normally fixed interest rate contract. For private single family houses the payments on the homes are constrained by lenders conventions to be well within the expected wage income of the buyer. For income property the mortgage payments are well within the expected rent rolls. As a result the standard mortgage is now a hedge financing instrument.

Thus the financial reform legislation of the 1930's removed two usages making for instability from the financial system, the Ponzi financing of stock exchange equities and the speculative financing of housing and commercial property and replaced them with financing relations that related payment commitments more closely to cash receipts on income account.

An indeterminate

but quite likely substantial part of the resilience exhibited by the financial system and the economy after 1966, 1969/79 and 1974/5 can be imputed to the lack of "secondary waves" which would have radiated from the stock exchange and property markets if Ponzi and speculative finance had still been the rule.

Policy therefore can affect the stability characteristics of a capitalist economy as it affects the mix of hedge, speculative and Ponzi finance. In the classification of financial relations a special role has to be assigned to equity financing. Although the large corporations may view their traditional or normal dividend payment as a form of contractual commitment, in fact dividends in excess of earnings are not paid for long. A liability structure of ordinary firms which is heavily weighted towards equity financing is more conducive to financial stability than a liability structure of firms that has a heavy weight to long and short term debt. Legislation that is conducive to equity financing by firms is stability enhancing. Thus the various New Deal reforms which tended to build confidence in the integrity of business following the revelations during the crash of financial malfeasance were stability enhancing, even as the various revelations about insider manipulation and abuse of corporate authority in the 1970's tended to depress stock market prices and discourage stock ownership.

From the point of view of the stability of the financial structure legislation which provides for preferential tax treatment of corporate interest ~~and corporate dividend~~ payments, so that the use of debt is encouraged is ill advised. Although regulation of the liability structure of individual companies is perhaps a hopeless task, the ability of the Central Banks to offer and withold secondary market protection to various types of debt is

an important determinant of overall stability. An increase in the importance of the discount window that provides bank reserves through private debt will be stability enhancing.

It is important to note that stability of gross profits after taxes - in particular the type of stability which a big government provides when it protects against sharp declines in aggregate gross profits - is an inducement to extend debt financing. The stability of cash flows to business in an environment of stable institutions and prices leads to potential profit opportunities, especially from innovations of financing techniques.

Is is worth noting that the various cash flow related inducements to invest such as investment tax credits and accelerated depreciation that were intruded into the corporate tax structures since the 1960's are destabilizing in two ways. One is that the larger cash flows available to investing units is an inducement to invest by levering to engage in speculative or Ponzi finance. The second is that to the extent that these measures succeed in inducing investment they tend to increase the ratio of investment to total income, which also is destabilizing.

Further implications of the financial instability hypothesis are that prolonged steady growth and soft-landings from an inflationary expansion are not likely events. Policy for a capitalist economy must recognize the limitations and flaws of capitalism if it is to be more successful than hitherto. In particular as long as an economy is capitalist it will be financially unstable; however as a comparison of the unstable mid-1920's/mid-1930's and the unstable mid-1960's to date makes obvious the overall behavior of

the economy can be quite different. To repeat, even though all capitalism are unstable, the systemic characteristics that result from the underlying instability can be quite different. "Stagflation" is a resolution of an unstable situation that is an "alternative" to a deep depression.

VIII. Conclusion

In a world in which institutions are free to evolve, I fear that Keynes's wish that "economists become technicians" can never be realized. Technicians apply a set theory to a variety of detailed problems; the set theory is useful because institutions do not change. However economies evolve, and with the evolution of the institutional structre the apt set of legislated institutions and policy operations change. One generation of economic theorists cannot render their successors obsolete. Economists can never be mere technicians applying an agreed-upon theory that is fit for all seasons; as the institutional structure changes the apt formulation of economic relations also changes.

When the economic theory that is used in forming plicy misspecifies the nature of the economy in fundamental ways then economic policy is apt to make things worse, not better. I fear that in the years since the emergence of financial instability as a strong characteristic of the economy - i.e. since the middle '60's - economic policy under four presidents has made things worse. However even while presidents and parties changed the monopoly of economists of the neo-classical persuasion in the formation of policy has not changed. In a good measure the "muddle" of recent years has been iatrogenic - the physicians have induced the disease.

Notes

1/ As C. P. Kindleberger points out the financial instability hypothesis, which 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, C.P., Manias, Panics, and Crashes: A History of Financial Crises, Basic Books, Inc. New York (1978), p. 15.

I would add Karl Marx and John Maynard Keynes to the list of great economists who held that a capitalist economy is endogenously unstable.

2/ Among the "key works" in the emerging post-Keynesian synthesis are:

Joan Robinson, Economic Heresies, London, MacMillan (1971).

P. Davidson, Money and the Real World, New York, John Wiley & Sons (1972).

J. A. Kregel, The Reconstruction of Political Economy, London, MacMillan (1973).

S. Weintraub, A Keynesian Theory of Employment, Growth and Income Distribution, Philadelphia, Chilton (1966).

Victoria Chick, The Theory of Monetary Policy, London Gray-Mills Publishing, Ltd. (1973).

Also, John Maynard Keynes, The General Theory of Employment, February 1937, pp. 209-223.

My contributions to this discussion includes

John Maynard Keynes, New York, Columbia University Press (1975).

3/ Keynes, John Maynard, The General Theory of Employment, Interest, and Money, New York : Harcourt Brace 1936.

4/ Perhaps the best references are for the dyq standard theory are:

J. R. Hicks, "Mr. Keynes and the Classics: A Suggested Interpretation," Econometrica, 5 (1937), pp. 147-159.

A. Hansen, Monetary Theory and Fiscal Policy (New York: McGraw-Hill, (1949)).

F. Modigliani, "Liquidity Preference and the Theory of Interest and Money," Econometrica, XII, (1944).

D. Patinkin, Money, Interest, and Prices, (Evanston, Ill.: Row-Peterson and Co., (1956)

5/ J. Viner, "Mr. Keynes and the Causes of Unemployment," Quarterly Journal of Economics (November 1936) 147-167.

6/ J. M. Keynes, "The General Theory of Employment," Quarterly Journal of Economics (February 1937) pp. 209-223.

7/ See Michal Kalecki, "Selected Essays on the Dynamics of the Capitalist Economy 1933-1970", Cambridge, at the University Press 1971 especially Ch. 7, The Determinants of Profits, pp. 78-92.

8/ Harrod, Roy Forbes, The Life of John Maynard Keynes, New York : Harcourt, Brace & World, (1951) p. 642.

9/ Ackly, Gardner, Macroeconomic Theory, New York : MacMillan, (1961)

10/ Friedman, Milton, The Theory of the Consumption Function

11/ Modigliani, Franco

12/ "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 expense of obtaining this output. . ." General Theory, p. 135.

13/ For details on the definitions of these financial postures see H. P. Minsky, The Modelling of Financial Instability: An Introduction Modelling and Simulation, Volume 5, Proceedings of the Fifth Annual Pittsburgh Conference, Instrument Society of America 1974.

14/ "In the United States the production of investment goods with significant gestation periods involves a two stage financing process. The first or interim financing involves the use of short term, typically, bank credit as the investment good is being put together. This is the financing of the construction contractors and the tool makers. The second stage involves the financing of the firm that is going to use the finished investment good as a capital asset in production. This "take out financing" will be a combination of mortgages, bonds, new equity issues or retained earnings of the purchasing firm. The funds so raised will be used to pay the tool and plant builders. The interim or production financing is a variant of Ponzi finance in that the price paid for the completed investment good "pays off" the accumulated debts and generates the profits, if any, of the capital asset producers.

15/ Kalecki, M. op. cit.

16/ "Did Monetary Forces Cause the Great Depression", New York, W. W. Norton & Co. Inc. (1976).

17/ The chronic problems of agricultural credit under free market conditions may reflect the banker's abhorence of price structures in which price is not built up out of costs by suppliers. Agricultural producers could not 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.

18/ Haberler, G. "Prosperity and Depressions", League of Nations (1937)

19/ 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.

20/ See H. P. Minsky, John Maynard Keynes, op. cit. Chapter 4, "Capitalist Finance and the Pricing of Capital Assets", pp. 69-92, and Chapter V, "The Theory of Investment", pp. 93-116.

21/ In the United States the position making instrument has evolved over the post-war period and the Federal Reserve has often lagged in recognizing that the instrument has changed. See H. P. Minsky "Central Banking and Money Market Changes" Q. J. E. (1957).

22/ Flow of Funds Accounts 1946-1975 Board of Governors of the Federal Reserve System, Washington, D.C. Unfortunately the emphasis in the Flow of Funds accounts is upon investment and its financing rather than upon the payment commitments embodied in financial instruments.

23/ See H. P. Minsky:

"The Evolution of American Banking: The Longer View", The Bankers' Magazine (1966); "Problems of Monetary Policy"; The Bankers' Magazine (1973); "Financial Instability, the Current Dilemma and the Structure of Banking and Finance", Compendium on Major Issues in Bank Regulation, United States Senate, Committee on Banking, Housing and Urban Affairs, 94th Congress 1st Session, Washington, D.C., U.S. Govt. Printing Office (August 1975) pp. 310-353; "Financial Resources in a Fragile Financial Environment", Challenge, (July August 1975); "Banking in a Fragile Financial Environment", Portfolio Managers' Journal (Summer 1977).

24/ The correlation between "money" and expansion or inflation is thereby a part of the process and not a simple one directional causative relation. In particular during periods of an autonomous or induced innovations in finance, the money supply investment financing relation becomes tenuous.

25/ See H. P. Minsky, "Central Banking and Money Market Changes", op. cit.

26/ See Kindleberger, op. cit. Chapter IX for historic instances.