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A Theory of Systemic Fragility

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by

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I. Introduction

My aim is to explore why we have had three near or incipient financial crises since 1966, whereas no such episodes occurred in the first twenty years after World War II. The argument that follows is that a fragile financial structure, which is a precondition for a financial crisis, now exists and that the emergence of a fragile financial structure, out of the robust structure that ruled at the end of World War II, resulted from the processes by which investment and positions in the stock of capital-assets are financed in our economy.

Although the theory is stated in terms of robust and fragile financial states and the progression between them, in truth there is a continuum between these polar states. From the Flow of Funds accounts numbers can be derived which indicate that the economy is on a robustness-fragility scale, but these numbers measure changes and trends and cannot tell us what will happen. This is so because institutions, usages, and policy interventions are important in determining how any fragile (or incipient crisis) financial situation will develop. Our economy is a historical and not a mechanical system. In order to understand our economy we have to leave the easy world of econometric simulations, and computer print-out and enter the tough world in which institutions, usages, and policy affect what happens.

Because of time limitations, I will have to make many of my points by assertion rather than by detailed argument. However this expository form should clearly reveal the forest, even if the trees are vague and imprecise. This is not a numbers paper. I have given some of the numbers elsewhere.[1]

To put my argument bluntly, the incipient financial crises of 1966, 1969-70, and 1974-75 were neither accidents nor the result of policy errors, but were the result of the normal functioning of our particular economy. The cumulative changes which occurred in the financial structure over 1945-1965 resulted from profit seeking activity in our economy; an economy which uses decentralized markets not only to produce and distribute but also to deal in capital-assets and finance investment. As a result of normal market behavior the extraordinarily robust financial structure inherited from World War II, in which a financial crisis was a virtual impossibility, was transformed into the fragile structure we now have, in which the periodic triggering of a financial crisis is well nigh certain.

The past decade has shown that in our economy, with a big government and passably effective "lender-of-last-resort" operations by the Federal Reserve, F.D.I.C., and explicit or implicit consortia of giant banks, a cumulative debt-deflation need not follow upon an incipient financial crisis but can be aborted. However in our economy success in aborting an embryonic financial crisis leaves a residue which virtually assures that a period of accelerating inflation will follow.

The resiliance the economy showed last year was due to an accidental but crudely apt fiscal policy - money was literally thrown at the economy - combined with successful lender-of-last-resort operations. The recovery over the four quarters (1975II-1976I) cannot be imputed to either an inherent resiliance of our monetary and financial system or to a self-equilibrating property of the income generating mechanism. In a trivial and uninteresting sense 1974-75 vindicates Keynes.

II. Some Definitions

In what follows we will deal with our economy. Our economy is a capitalist economy with sophisticated and complex financial institutions and usages.

"Financial fragility" is an attribute of the financial system. In a fragile financial system continued normal functioning can be disrupted by some not unusual event. "Systemic fragility" means that the development of a fragile financial structure results from the normal functioning of our economy; financial fragility and thus the susceptibility of our economy to disruption is not due to either accidents or policy errors. Therefore a theory of systemic fragility endeavors to explain why our economy endogenously develops fragile or crisis prone financial structures.

Once fragile financial structures exist the incoherent behavior characteristic of a financial crisis can develop. Incoherent behavior occurs when the reaction to a distrubance amplifies rather than dampens the initial disturbance. A financial crisis starts when some unit cannot refinance its position through normal channels and is forced to raise cash by unconventional instruments or by trying to sell out its position. Inasmuch as the assets in position have thin markets (a characteristic of positions that are financed rather than traded) excess supply leads to a sharp price break. Once this occurs the initial disequilibrium is made worse. Other units experience a decrease in asset values and thus will have difficulty in making position. History -- as well as the theory of the determination of

capital-asset prices - indicates that a financial crisis is a necessary and apparently sufficient condition for a deep depression. Thus an economy with systemic financial fragility will have a deep depression from time to time.[2]

III. Paradigms in Economics

Some two hundred years ago Adam Smith set two problems for economics. One is to explain why a decentralized market mechanism yields a coherent result. The second is to explain why one country is richer or poorer than another - or why a country grows richer or poorer over time.

The response to Smith's first problem is the substance of pure economic theory. Pure theory shows that within "barter" paradigm models decentralized markets lead, under quite restrictive assumptions, to a coherent result. "Barter" paradigm models focus on trade and simple production. They abstract from time, money, uncertainty, history, policy, capital-assets of the kind we know exist, and the financial institutions and usages which are associated with "Wall Street". Economic theory has not shown and has not attempted to show that an economy with the capital-asset, monetary, and financial characteristics of our economy is coherent. As a result of the limitations of standard theory, it is not legitimate to add money onto a "barter" paradigm model of the economy, as is done by both the quantity theorists and the standard Keynesians, and then draw inferences about the behavior of our economy.

Smith's second problem, to explain the relative richness or poverty of different countries or of one country over time, has been answered in terms of differential endowments of capital-assets. These differential endowments are the result of past accumulation. Accumulation depends upon an ability to generate and effectively allocate

a surplus. In our economy the surplus is extracted and allocated by the market processes which finance investment and the government processes which determine taxes and spending.

"Wall Street" will serve as the label for the institutions and usages that generate and allocate the finance for investment and for positions in the inherited stock of capital-assets. In our economy the behavior of "Wall Street" is a determinant of the pace and direction of investment. A model of the economy from the perspective of "Wall Street" differs from the standard model of economic theory in that it first sees a network of financial interrelations and cash flows and then a production and distribution mechanism. A "Wall Street" paradigm is a better starting point for theorizing about our type of economy than the "barter" paradigm of conventional theory.[3]

From the perspective of "Wall Street" economic theory has to explain the prices of capital-assets and equity shares, instruments which have value only because they are expected to be "profitable" or to pay dividends over some future period. A further problem of economic theory is to determine the relation, if any, between the prices of existing capital-assets and the prices of current output and the effect, if any, that various alignments of these two sets of prices have upon the behavior of the economy.

The prices of capital-assets are determined by expected future profits and portfolio preferences. Portfolio preferences and relative supplies determine the prices of various capital and financial assets, which differ in the incomes they are expected to yield, carrying costs, and liquidity. Money is an asset, with particular

yield, carrying costs, and liquidity characteristics, whose price is always one. The money prices of other assets are determined by their special characteristics and their relative scarcity.

Money therefore directly affects the price level of various capital-assets and financial assets - it does not directly affect the price level of current output. The proximate determinant of the price level of current output is the money wage rate and, roughly speaking, the weight of disposable incomes derived from government activity and the production of investment goods in total disposable income.[4] Thus the proximate determinants of the two price levels are quite different.

The money wage rate is a dominant determinant of the supply price of investment output. The price of a capital-asset is a determinant of the demand price of a comparable investment good. Given that the price level of capital-assets and investment output are based upon quite different principles, it is not surprising that, at times, they can and do get out of "alignment". This is especially so when, as is true for our economy, positions in capital-assets as well as the investment output in the process of being produced are debt financed, so that changes in financing terms will affect both the supply price of investment outputs with significant gestation periods as well as the market valuation of capital-assets.

IV. The Dimensions of Financial Fragility

A. Introduction

To put meat upon a "Wall Street" paradigm approach to economic theory, a precise statement of the determinants of the robustness or fragility of a financial structure is necessary. One determinant of the robustness-fragility of a financial system is the mix of hedge, speculative and "Ponzi" finance in the economy. Another determinant of robustness-fragility is the weight of cash or near cash assets in portfolios: the liquidity narrowly defined, of various classes of units. A third determinant is the extent to which ongoing investment is debt financed.[5]

A financial contract is a money today-money tomorrow deal. Money today-money tomorrow deals are a pervasive reality in our economy. Such deals - in the form of money loans, bonds, bank deposits, equities, shares, insurance contracts, mortgages, etc. - are the essence of financial businesses. In addition, in our economy, capital-assets - plants, equipment, housing, commercial estates, and inventories - are particular and essential money today-money tomorrow contracts: Capital-assets are best thought of as a special type of financial instrument. Whereas in the world of finance the money tomorrow part of the contract is a commitment of some household, business firm, or government unit, in the capital-asset "contract" the money tomorrow is the gross profit income of some business enterprise operating with its particular management, in specific markets, and in a particular economic context.

Capital-assets therefore yield cash flows over time, the cash flows depend upon how demand for outputs that use the services of the particular capital-asset develop. Positions in such capital-asset S are financed by combinations of debts and equities. The cash flow problem of a unit owning capital-assets can be characterized as a balancing of the cash receipts from operations and the cash payments due to debts. In a "Wall Street" paradigm model, all units are like a banker who maximizes profits under liquidity and solvency constraints.

B. Hedge, Speculative and Ponzi Finance

The liabilities of a unit state the dated, demand or contingent cash payments that it has to make; these cash payments are on account of principal and interest. The cash to make such payments can be on hand or obtained from the cash flow due to (1) the operations of the unit, (2) the fulfillment by others of owned contracts, (3) the sale of an asset, or (4) the issuance of debt. There are limitations to the sale of some assets; for business corporations the capital-assets used in production and for financial units some assets with thin markets will be difficult to sell to raise cash. Such assets are the unit's position.

If unit's cash flow commitments on debts are such that over each significant period the cash receipts are expected to exceed the cash payments by a significant "margin" the unit will be said to be engaged in "hedge financing". A household whose monthly income far exceeds the monthly payment on a home mortgage and which has few other debts payments is a hedge financing unit. A profitable firm which

has virtually no short term debt and which has mainly equity liabilities is a hedge financing unit.

A speculative financing unit has cash flow payments over some periods - typically near term - which exceed the cash flows that are expected over this period. This situation usually arises because the principal amount of some debt is due: contractual and demand cash flow commitments are on account of both principal and interest. On the other hand the present value of the cash flow that is expected to accrue to the firm from owned assets exceeds the present value of contractual cash payments. A speculative financing unit has a positive net worth, even though in some near term periods cash payment commitments exceed the cash flow from operations. What both the borrower and the lender expect - and they expected it when the deal was set up - is that the debtor will be able to refinance his position. New debt will be "sold" or "issued" to raise funds that will be used to pay maturing debt.

A "Ponzi" financing unit is a speculative financing unit for which the interest portion of its cash payment commitments exceeds its net income cash receipts. A "Ponzi" unit has to increase its debt in order to meet commitments on outstanding instruments. Units engaged in "Ponzi" finance may have a "negative net worth" on any honest computation of present values; however units may engage in "Ponzi" finance with substantial net worths if "accruals" account for a large part of income.

Whereas units which engage in hedge finance are vulnerable only to what happens in the market for their product (or whether the terms

on owned contracts are fulfilled) units which engage in speculative or "Ponzi" finance are also vulnerable to changes in financial markets.

Commercial banks and depository institutions, such as Savings Banks of various kinds, typically engage in speculative finance: The term to maturity of their debts are shorter than that of their assets. They need to continually attract or purchase deposits in order to be able to meet withdrawals: "Liability management" banking is more speculative than "asset management" banking. The shorter term of debts than assets in banking means that banks are vulnerable to financial market developments: untoward developments can increase the carrying costs of assets in position without necessarily improving their cash flows.[6]

C. "Present Values" of Cash Flows

One difference between units that hedge and speculative finance is that the present value of a hedge financing operation is always positive regardless of movement of interest rates whereas the present value of any speculative financing unit, for which the surplus cash flows come later than the deficit cash flows, will be positive or negative depending upon the ruling pattern of interest rates. For units that engage in speculative finance a rise in both short and long term interest rates can transform a positive present value into a negative present value.

Furthermore a rise in interest rates can transform a speculative unit into a "Ponzi" financing unit, in that upon refinancing the cost of carrying position can exceed the income from the assets in position.

The fragility of the financial system depends upon the number of things that can amplify initial disturbances. Hedge, speculative, and "Ponzi" financing units alike are vulnerable to events which reduce the cash flows from assets. A decrease in income from operations, or a "default" or "restructuring" of the debts owed to a unit, can transform a hedge financing unit into a speculative financing unit. For things to go wrong with a hedge financing unit something first had to go wrong someplace else in the economy - unless the hedge characteristics of the initial financing was based upon unrealistic euphoric expectations with respect to markets and their growth. On the other hand, speculative and "Ponzi" finance units are vulnerable to changes in interest rates. Increases in interest rates will increase cash flow commitments without increasing receipts. Furthermore as they must continuously refinance their positions, they are vulnerable to financial market disruptions. The greater the weight of speculative finance in the total financial structure the greater the fragility of the financial structure.

D. The Thrust to Speculative Finance

That our economy transists from robust to fragile financial structures is evident from data and from history, which contains numerous examples of financial crises. What we need to add to our ability to point at data and events and say "that is what we mean" is an argument as to why such changes take place. Why is it that the volume of short term indebtedness tends to increase and the holdings of cash assets tend to decrease until the financial structure

becomes sufficiently fragile so that a financial crisis or near financial crises occur?

Our economy is characterized by private ownership of capital-assets and the existence of a wide variety of financial instruments which finance ownership and control over these capital-assets. In particular, in our economy, as it is currently organized, an overwhelming proportion of the capital-assets are owned by corporations and their equity shares, bonds, and short term indebtedness are the assets which households either own directly or through the intermediation of some financial institution.

Each collection of assets - financial or capital - is characterized by two explicit and one implicit cash flow. One explicit cash flow is the income - for capital-assets the quasi-rents - it will yield. The other explicit cash flow is the carrying costs. The implicit cash flow is the liquidity yield, which is the value of the insurance that some assets provide because the can easily be turned into cash in order to fulfill payment obligations. Money, which is the unit in which debts are denominated, is the "premier" example of a liquid asset, but other financial instruments such as Treasury debt and commercial paper can have considerable liquidity as long as the market for these assets functions. However for assets other than money which have liquidity attributes the possibility exists that when the liquidity is really needed some "price concession" will have to be made to acquire money - they will sell at a discount relative to money.

As a result of the various mixes of yield, carrying cost, and liquidity that assets embody - and the yields, carrying costs, and liquidity of assets differ in how assured they are - the relative prices of assets are determined. Given that the price of money is always one, asset prices in money are determined.

The yields - or quasi-rents - of the items in the stock of capital-assets are determined by the functioning of the economy. In a simple formulation the gross profits after taxds are determined by the expenditures on investment.[7] On the other hand if the quantity of money and near monies are plentiful the yield on assets that embody a fair amount of liquidity will be low. If investment is proceeding apace in an economy with a robust financial structure short term interest rates will be significantly lower than the yield on capital-assets and the expected yield from newly produced capital-assets i.e. investment.

In a regime of robust finance the rate pattern, even during periods of only reasonably active investment, will be such that one can make on the carry by financing positions, in both long-term financial assets and capital-assets, by short term debt. Given that financial institutions and usages are such that the supply of bank financing is within significant limits determined by the interaction of bankers and their customers and given the existence of a wide spectrum of financial instruments, a substitution of "liquid assets" for money in portfolios will yield funds to finance positions in assets.

Such an endogenous increase in money and liquid assets pushes up the price of capital-assets relative to the price of money, liquid assets, and current output. The increase in the price of capital-assets increases the difference between capital-asset and investment goods prices. Given the robustness of finance and the elasticity of short-term financing an increase in the rate of investment will follow. Once again simplifying the story a bit this increases the yield from the existing items in the stock of capital-assets.

Fundamentally, while the constraints through the techniques of production may define the acceptable sets of production techniques, acceptable financing techniques depend upon the current subjective preferences of bankers and businessmen and their current views about the prospects of the economy. In the financial structure that ruled in the 1950's, businessmen and bankers were correct in being willing to increase their short term indebtedness. The only problem is that "success" breeds a disregard of the possibility of "failure"; the combination of the successful operation of the economy over a long stretch and the absence of serious financial difficulties over a substantial period led to the development of an "euphoric" economy in which short term financing of long positions became a way of life to many organizations.[8]

Inasmuch as institutions, usages, and "personnel" changed between the financial trauma of the 1930's and the 1960's, it was quite natural for central bankers, government officials, bankers, businessmen, and even economists to begin to believe that a "new era" had

arrived. The warnings that nothing basic has changed, that we still could reach a breaking point, so that a deep depression was still possible, were ignored. As the doubters of permanent prosperity did not have printouts to prove the validity of their views, it was quite proper to ignore arguments drawn from theory, history, and institutional analysis. Nevertheless, it is evident that in a world of uncertainty, capital-assets with a long gestation period, private ownership, and "Wall Street" successful functioning of the economy, within an initially robust financial structure, will lead to an increase in short-term speculative finance, so that the financial structure becomes even more fragile as time elapses.

E. "Cash Kickers" and Margins of Safety

Borrowing and lending takes place on the basis of various margins of safety. One margin of safety is the excess of expected cash receipts over cash payment commitments for all time periods. This margin of safety exists for units which engage in hedge financing but does not exist for units which engage in speculative finance. A second margin of safety is the excess of the present value of assets over the present value of liabilities. This margin of safety exists for units that engage in both hedge and speculative financing, but as the markets for the assets in portfolios are often very thin, the excess of present value may well evaporate if the need to sell assets to meet payment commitments ever arises. A third margin of safety is the holdings of "cash kickers", money and liquid financial assets that are superfluous to operations, so that a small shortfall in cash receipts or an unexpected need to make payments will not disrupt normal functioning.

From the above overview of margins of safety, it is apparent that units - and economies - that are heavily into speculative finance should keep large cash kickers. Commercial banks are inherently speculative organizations and the "reserves" banks keep are cash kickers. However as we look at our economy, it is evident that the greater the volume of speculative finance relative to total financial interrelations, the smaller the cash kickers. One or more of three things will have had to change for this to be so: views about or the importance attached to various uncertainties diminish, the payoffs from speculative finance increase, and the costs of carrying cash increase. In the later stages of the development of a fragile financial situation a speculative boom - in the stock market, in tulips, in Florida real estate - is likely to occur reflecting increased short term payoffs from speculative finance and a downgrading of uncertainties. These subjective changes make the development of an investment boom, especially a boom in investments with extended gestations periods, likely.

F. Conclusions

The above has been sketchy. The theory of the working of our economy that is based upon emphasizing finance rather than barter is complex, and departs from standard theory at many points. But the major difference is in the conclusion. Within standard economic theory the financial crises and big depressions of history are anomalies. The economic theory of the 1920's could not explain the 1930's. Hence Keynes' effort to construct a new theory that made

the anomaly a usual event: his view of The General Theory was that it explained why our economy was so liable to fluctuations.[9]

The development of economic theory over the post-war period neglected financial considerations in determing the behavior of the economy, so that the instability of the past decade is an anomaly. Obviously a theory which cannot explain what is happening except by appealing to "errors" or "accidents" is unsatisfactory. Current standard economic theory - the so called neo-classical syntehsis - doesn't even address the problems which are represented by the crisis prone behavior of our economy.

V. Investment Programs as Financial Contracts

The financing of investment during its gestation period is another determinant of the robustness or fragility of the financial structure. Some unit - whether it be the ultimate user of the capital-asset, the contractor, or the supplier of non-human inputs - has to make payments for labor and raw materials as an investment project progresses from its initial conception to completion. An investment program involves commitments to pay cash as the work progresses, and thus it is like a debt.

The funds for these payments can come from a number of sources: gross profits of the "purchaser", bank loans, long term bonds, new equities, etc.. When an investment project has a long gestation period, like a nuclear power plant or a condominium complex, funds to make such progress payments may be required over a number of years and will be "frozen" in the project until it is completed. The cost and the present value of an investment project while it is in process will vary with financial market conditions.

As it starts an investment project a unit can raise all of the external funds it feels it will require for the project with long term debt, so that upon completion of the project the cash flows from operating the project will fulfill the debt commitments. Such financing is a form of hedge financing. However for an investing unit such hedge equivalent financing carries conjectural elements which are not present in the financing of in-being capital-assets: the amount of external financing required depends upon the internal

funds generated, the returns earned upon the initial excess short term funds depends upon money market conditions, and the cost of the project depends upon the time it takes to completion. As we all know engineers and architects estimates of time to completion of projects are almost as error prone as economists forecasts: even prior financing has speculative elements.

Even though raising funds for investment projects by prior financing is possible, a sequential financing strategy is more usual. Different sources of funds are tapped as investment proceeds. In our economy, where large continuing corporations do a large part of investment, it is impossible to segregate the funds needed by a particular project from the financing and refinancing needs of the corporation as a whole. However the gestation period financing of investment involves commitments to pay cash at specified dates or stages and a parallel need to raise cash which constitutes a particularily inelastic demand for funds. Thus the costs of investment output, the present value of a project, and the overall financial structure of a unit which deficit finances investment projects are sensitive to money market changes. Furthermore a run up of the costs of investment output while in progress will tend to strip an investing unit of its "liquid" assets.

The extent of sequential and external financing of investment over the gestation period is a determinant of the overall speculative posture of the financial structure and thus of the fragility of the financial system. Any lengthening of the gestation period of investment, any substantial increase in the price level of inputs to investment relative to prices of output in general, any increase in the

ratio of external to internal funds in the financing of investment, and, once short term funds are used to finance investment goods in process, any increase in short term interest rates will increase the extent of speculative finance in the economy and thus the fragility of the financial structure. If speculative finance in general makes a financial structure fragile, then the speculative or sequential financing of investment is a particular sensitive part of the fragile financial structure. Whenever investment greatly exceeds the internal corporate cash flows available to finance investment, the economy is most susceptable to the emergence of an incipient financial crisis.

The "split" between construction and take out financing for housing and commercial construction was of particular importance in the incipient financial crisis of 1974-75. Housing - and this is true of condominium projects - involves a separation between the unit which "finances" the investment and the unit which "owns" the finished capital-asset. In fact the investment is typically completed before the sale of units is arranged. Thus any failure of sales to take place as scheduled will raise the cost of the project by the carrying costs on the investment. High interest rates and a slowdown of sales guarantee that difficulties, such as still plaque the banks with respect to the R.E.I.T.'s, will occur, and high long term rates are a guarantee that a slowdown of sales will occur.

If the gestation period of investment is long, and if a substantial part of the cost of a project is front loaded, then a rise in short and long term interest rates during the gestation period of a project can transform an initial positive present value into a negative

present value. If bankers are alert such developments should lead to a cutting off of funds and the abandonment of the project - at least until lower interest rates and a writing down of the sunk costs to a fair market value makes it feasable to proceed.

But even short of the transformation of positive present value into a negative present value, interest rate changes which raise the cost of the "finished" capital-asset and lower the completion date present value of the capital-asset will lead to a reduction in the margin of safety which underlies the particular deal. Three dimensions of the margin of safety have been identified: the excess of the value of assets over liabilities, the excess of cash flow receipts over payments, and "cash kickers" in the asset structure. All three will be adversely affected for investment in process by a rise in interest rates.

Whenever margins of safety are eroded, financing terms can be expected to reflect the increased uncertainty that lenders bear. Contractual interest rates are one dimension of financing terms. When the margin of safety for a unit deteriorates, its financing terms will increase beyond what takes place in measured market rates. Not only will the premium over market rate increase but the liquidity security and maintenance of net-worth provisions will become more constraining even as increased "prime" rates decrease margins of safety. But these financing "codicles", while designed to protect the lenders, make the position of the debtors worse - if only by constraining their freedom of action. Thus once financial fragility becomes significant, it seems as if an inexorable trend toward ever increasing fragility is triggered.

VI. A Brief Conclusion

There are two possible channels by which money market changes can affect income and employment: by diminishing aggregate demand by decreasing investment by first increasing interest rates (or directly decreasing spending if we accept monetarist contentions) and by inducing financial disturbances. Whenever money market changes lead to present value reversals or appreciable decreases in the margins of safety, then the possibility exists that refinancing will not be available i.e. that an incipient financial crisis will be triggered. Furthermore, if refinancing is achieved, (perhaps because bankers are "responsible") in spite of adverse cash flow commitments which make the present value of expected cash flow receipts and commitments either uncomfortably close to or below the present value of cash payments, a variety of "Ponzi" financing will emerge as important in the financial picture.

"Ponzi" finance, considered a joke played on gullible Bostonians, is ever present in a world in which speculative finance exists and in which the costs due to debts can exceed concurrent receipts from operations. If true current interest rate computations lead to "negative" or "too small for comfort" net worths, then borrowing to pay financial commitments becomes a form of "Ponzi" finance. Once "Ponzi" financing becomes a significant portion of the financial structure then either we go through a debt-deflation and a serious depression or we "float" the debt off by generating significant increases in the expected cash flows from operating capital-assets; increases which

may be possible only by inflation. To float off the debt we now have, we need to have a significant profit inflation even as privately financed investment is constrained to coporate cash flows. This can be achieved by having a large government deficit, such as we have had and are continuing to have, together with strong borrowers and lenders "risk aversion", which ruled in 1975 and is apparently easing now.

VII. An Aside on Monetary Policy

If the economy is characterized by a dominance of hedge finance, so that few firms can be adversely affected by rapidly rising and high interest rates if investment is largely internally financed, and if units are "liquid", in that portfolios contain a large value of financial assets which are superfluous to operations, then interest rates cannot move very much. Under these circumstances it is safe for the Federal Reserve to adopt a money quantity rule. Sharp variations in interest rates will not occur and if they do occur nothing much would happen.

If a large body of speculative finance exists, if corporate fixed investment is, to a large extent, financed by external funds, and if units have been largely stripped of liquidity then interest rates can move sharply and Federal Reserve actions must be constrained by a concern about the movement of interest rates. If the liquidity of private deficit financing units (investing corporations) has been impared, interest rates - especially short rates - can move quickly and range widely. Because the payment commitments on ongoing investment projects are inelastic with respect to interest rate changes, a short fall of the supply of finance leads to large increases in interest rates. Given the existence of speculative finance, these higher interest rates are quickly written into financing contracts. In a regime of speculative and fragile financial situations it is dangerous for the Federal Reserve to wear blinders which make the quantity of money rather than financial market conditions the proximate objective of monetary policy.

It is a paradox that when financial conditions were such that the Federal Reserve could safely ignore interest rates, a fear of money market disturbances was a constraint upon the operations of the Federal Reserve[9] whereas now, when financial conditions are such that higher interest rates can trigger reversals of present value, erosions of "margins of safety", and explosions of "Ponzi" finance, monetary policy increasingly emphasizes the quantity of money and de-emphasizes the significance of interest rate variations.

The only universal rule for Federal Reserve policy is that Federal Reserve policy cannot be dictated by any universal rule. Federal Reserve policy must adapt to the actual conditions in financial markets. The Federal Reserve must recognize that its responsibilities extend beyond the behavior of institutions labeled banks and statistical constructs labeled the money supply. The Federal Reserve must accept the responsibility to be the lender-of-last-resort to financial markets as they exist.

Federal Reserve economic policy duties can be divided into two spheres. Monetary policy is the day to day operations within a for now coherent set of financial markets. Lender-of-last-resort responsibilities are intermittent interventions designed to abort a threatening incipient financial crisis.

When the financial structure is robust then the need for lender-of-last-resort interventions is unlikely to arise; the Federal Reserve is free to think only about monetary policy actions. Furthermore these actions need not be constrained by any fear that a financial crisis can be set off. When the financial structure is fragile

then lender-of-last-resort responsibilities become important and should be dominant in determining Federal Reserve action. Furthermore because the range of variation of interest rates is greater, Federal Reserve actions need to be constrained by the knowledge that large and rapid increases in interest rates can trigger a financial crisis.

In the context of a fragile financial structure, a money supply strategy, such as has been identified with the monetarists, is a particularily inept exercise of Federal Reserve power. Once a fragile financial structure exists, Federal Reserve policy should try to induce behavior which tends to diminish the weight of speculative finance in the economy. This might very well require some control over the liability structures and asset-equity ratios of giant corporations and banks. At present the Federal Reserve has no power to affect such variables. My conjecture is that after the next "near miss" with respect to a financial crisis, the development of such controls will move onto the agenda for reform.

FOOTNOTES

1. H.P. Minsky, "Financial Resources in a Fragile Financial Environment". Challenge, July-August, 1975, presents some data on the trends of financial variables which are relevant to our theoretical formulation.

2. Irving Fisher, "The Debt-Deflation Theory of Great Depressions." Econometrica (1) 1933, 337-57.

Evans Clark, ed. The Internal Debts of the United States. The MacMillan Co. (Twentieth Century Fund) New York, 1933.

A.G. Hart, et. al. Debts and Recovery 1929-37. The Twentieth Century Fund, New York, 1938.

3. Hyman P. Minsky, John Maynard Keynes. New York, N.Y.: Columbia University Press, 1975, contains a fuller statement of the theory I am "asserting" here.

4. M. Kalecki, J. Robinson, N. Kaldor, P. Davidson, J. Kregal, S. Weintraub build on such a relation. For an introduction and guide to the material see either J. Kregal, The Reconstruction of Political Economy, MacMillan-London and Basingstone, 1973, or P. Davidson, Money and The Real World, John Wiley and Sons-New York and Toronto, 1972.

5. H.P. Minsky, "The Modelling of Financial Instability: An Introduction." Modelling and Simulation Vo. 5. Instrument Society of America. Pittsburgh, PA.: 1974, 267-273, gives a semi-mathematical statement of what follows.

6. Henry Simons, Economic Policy for a Free Society. Chicago: University of Chicago Press, 1948, discussed this flaw in finance.

7. See Kalecki et. al. Also H.P. Minsky, Prices in a Capital Using Capitalist Economy, forthcoming.

8. H.P. Minsky, "Financial Instability Revisited: The Economics of Disaster." Reappraisal of the Federal Reserve Discount Mechanism Volume 3, Board of Governors of The Federal Reserve System, Washington, D.C., June, 1972, 95-136.

9. J.M. Keynes, "The General Theory of Employment." Quarterly Journal of Economics, 51 (February, 1937), 209-223.