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Efficiencies, Institutions and the Contained Instability of Capitalist Economies

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EFFICIENCIES, INSTITUTIONS, AND THE CONTAINED INSTABILITY OF CAPITALIST ECONOMIES.

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"But coherence doesn't mean 'equilibrium'", Alice objected.
"When I use mathematics", Humpty Dumpty said, in a rather scornful tone, "it means what I choose it to mean - neither more nor less."
The question is", said Alice, "whether you can make mathematics mean so many different things."
The question is", said Humpty Dumpty, "which is to be the master - that's all."

--A corruption of an exchange in
Lewis Carrol's Through the Looking Glass

I INTRODUCTION

The post world war II performance of advanced capitalist economies and successful developing countries poses a parodox for economic theory: the "successes" took place in a framework of intervention and a structure of institutions that are inconsistent with the great theorems of economics that "demonstrate" the virtues of laissez-faire. The main stream in economics has largely ignored the paradox that is posed by 1946-66 being better that 1919-39 even though the capitalism of 1946-66 deviated much more from the lassez-faire model than the capitalism of the earlier epoch.

In a hard science a gap between theory and agreed upon observations would lead to a rejection of the theory. The experience of 1919-39 and 1946-66 represents such a gap. However in the hard sciences theory is a servent of observations, in modern day economics theory determines the acceptability of observations. In economics the post world war 2 era, during which government that intervenes (regulates) and taxes and spends on a grand scale was accompanied by the most successful performance modern capitalist economies have ever achieved, witnessed the full developement and sweeping success of the economic theory of how a decentralized market economy, in which government has a minimal role and where the actions of units are determined

(1) footnote

by their own views of their own self interest, leads to an optimal or efficient result in which no unit could be better off without some other units being worse off.(1) It is clear that the success of the interventionist-big government economies of 1946-66 had no impact on this line of theorizing and furthermore the interventionist- big government capitalisms were efficient in a sense other than that of the economic theorist.

A rational outsider looking at the economic theory of the 1980's would be much like the little boy who noted that the emperor had no clothes. The combination of the limping success of recent years and the quasi-golden era of 1946-66 should pose serious questions for the economic theorist. In this paper I pose four problem areas that economic theory need address: 1. the complex of efficiencies by which the performance of an economy is judged, 2. the relation between formal theory and mathematics, 3. conjectures that follow from appreciating that the endogenous dynamics of a capitalist economy is prone to lead to unacceptable system states, and 4. how institutions and interventions contain the dynamics so that the economic result is acceptable.

The conclusions in what follows are tentative: the program for research that is advanced is not. The research program of economics needs to center on " How do the actual institutions of capitalism affect stability and growth,

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1 Arrow, DeBreau, Arrow -Hahn

given that we know that complex economic systems should by their internal dynamics degenerate into incherence?". This program requires us to do economics without the crutch of assuming equilibrium, even as the end result of the interaction between market processes, institutional behavior, and government interventions is an absence of incoherence.

II EFFICIENCIES

Efficiencies

In an article on multinational banking, Jean and Peter Gray distinguish between the stabilization and allocational efficiency of an economy. They argue that it is possible for an economy with a particular institutional structure to be superior in its stabilization ~~efficiency~~ properties as compared to an economy with a different institutional structure, even as if inferior in its allocational ~~efficiency~~ properties. For example, within a Kaleckian framework, if business is heavily indebted a big government capitalism is superior in its stabilization properties to a small government capitalism even as it is inferior in its allocation ~~efficiency~~. This is so because government deficits stabilize profits even as taxes and spending drive "price wedges" between buyers and sellers on various markets. In a capitalist economy with a modern banking system there is a trade-off between the two efficiencies.

We can go beyound the Gray and Gray dichotomy of allocation and stabilization efficiency and add growth, inflation, distribution and technical dynamism to our list of "efficiencies". In the light of concerns with innovations in technology and finance - with what we can call the Schumpeter connection - it may very well be true that an industrial and financial structure that is conducive to innovation in technology is susceptible to debt deflations. Furthermore there are compensation systems as well as shop

floor organizations that affect the costs of technical change. The quick response of wages to rising prices in institutional structures that lead to de facto or de jure indexation of wages may affect the viability of liability structures and the risk-return relation for technical change.

Perhaps the biggest failure of interventionist capitalism has been due to the lack of understanding how institutional arrangements accepted for good reasons - such as trade union power - can abet inflation and retard technical progress. Fiscal and monetary policy actions always have a structure and the structure implies a particular set of impacts that affect the various efficiencies. Thus a tax system that is progressive, so that sharp declines in revenue occur when income and employment declines, is likely to be stabilization enhancing even as it may retard risk taking associated with technical innovation.

When economists consider innovation all too often the focues is on technical change, however, innovations also occur in labor and in finance. Innovations in labor take place in the compensation system or in the way work is organized. Because of the impact of the tax structure and the power of group insurance in lowering rates a major change in the compensation system took place in the United States and fringe benefits rose relative to taxable compensation. In a sense some of the fringe benefits took the form of income in kind - the compensation system is to deliver a particular level of coverage as far as medical care is concerned. The fringe benefit innovation in compensation systems often led to a rise in the market power of the suppliers of the fringe benefit and therefore a rise in the price per unit of the fringes. The system of third party medical payments that was designed to avoid the socialization of medicine has had destabilizing impacts upon the general level of prices.

There is ~~one~~ an efficiency-inefficiency trade off in finance where the differences between Italy and the United States ~~is~~ are dramatic. Both countries have done rather well in the past several years, both countries are sophisticated in their financial practices. After all, even though Lombard Street is no longer the main citadel of capitalist finance, ~~the term~~ the bank which refers to the ~~still~~ epoch of power and innovation leadership of British bankers earlier in the Capitalist invokes the centrality of sophisticated financial practices in capitalist ~~term~~ economies. However, whereas the larger or giant multi-billion dollar corporations whose shares are publically traded ~~is~~ are the backbone of the private American economy, ~~this variety of~~ such publically owned corporations ~~is~~ are not a dominant ~~perhaps not even a prominent~~ part of the Italian scheme. In part this is due to the much greater extent of public ownership in Italy, in part this greater extent of public ownership reflects the absence of markets and institutions which can finance a divesture of enterprises owned by state financial institutions.

In the United States about the time the second World War ended an implicit agreement on a "socially responsible" corporate form emerged. The ~~newly~~ more "legitimized" corporation was to earn substantial profits, however these profits were not to be used to support "excessive" compensation for corporate management or "large" dividends for stockholders; this corporation could be in debt, but debt is not to absorb a heavy part of the gross flow of funds to the corporation.* This socially responsible corporation was not to "sweat" its labor, whether it was unionized or not, ~~and~~ but the large cash flow retained within the firm was to go to finance technical progress and investment. Although the stock bonus arrangements made management conscious of the price of the stock in the market, operating so as to manipulate stock prices was frowned upon.

~~*Footnote reference to FNBC.~~

Over the past several years ~~and at an apparently increasing pace over the past several months~~ a series of leveraged "buyouts" and takeovers have occurred. An ostensible aim of these ~~buyouts~~ transactions is to give the shareholders "value" for their shares. The technique, used to create value, is to raise the indebtedness of the surviving corporation. As a result ~~of the change~~ the surviving corporation is so heavily in debt that a large part of its cash flow is committed to debt payments. ~~The resulting corporation has~~ and more is very little in the way of ~~an~~ uncommitted cash flows that can finance investment and innovative technologies. Furthermore, because the margin between cash receipts and payment commitments is much diminished any fall in revenues below anticipated will force the company to try to reduce "wage costs"; ~~the~~ financial restructuring can may make it necessary to "sweat labor". The post-war concensus about the way corporations are to go about their business has broken down, and with it the question is open as to how innovative technologies that require the hazarding of large amounts ~~is~~ are to be financed. A paradox may emerge in that the financial restructuring during the Reagan years, during an administration that ~~is~~ was determined to diminish the role of government in business, may lead to a greater government involvement in determining the structure of innovations and the financing of investment than has hitherto been true.

Once ~~the~~ various efficiencies are identified ~~then~~ the question economic theory has to address ~~theory has to address~~ is how they are related, so that ~~we can address~~ light can be thrown on the question of how institutional structures affect ~~the~~ relations among ~~the~~ efficiencies. The questions that theory need be concerned with changes: to address the allocation vs. stabilization efficiency question the "model" need be capable of generating allocational inefficiencies as well as instability, and it needs to be able to evaluate the impact of alternative institutional specifications upon these efficiencies (6) Similarly if growth, inflation, distribution and technical dynamisms are

III FORMAL THEORY AND MATHEMATICS

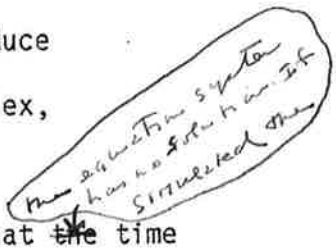
The Gray and Gray insight opens up many issues, which I hope we will address during this week.

III. The Formal Theory and the Mathematics

With many apologies to the ghosts of D.H. Robertson and Lewis Carrol, I prefaced this paper with a corruption of an exchange between Alice and Humpty Dumpty. Although we are not mainly concerned with making advances in pure theory, we needs to work within a theory in which institutional arrangements matter, ~~in which~~ the nature of the path through time of ~~the~~ system depends upon institutions. Because theory nowadays is often mathematical in its language - and theorems are proven in a formal way - we have to examine how the way problems are formulated affect the theorems that are proven. The mathematical formulation constrains the theorems that are demonstrated.

An economy is a multidimensional system. It has long been known that well behaved linear n-dimensional systems will have a solution. If the solution to a model is identified as an equilibrium, then the way in which the economic analysis ~~is~~ must be forced if the analysis is to be mathematically tractable is known. But the world is more complicated

then simple linear systems ~~would~~ allow. In order to study accumulation, the system has to be time dependent. If the system is capitalist then monetary and financial considerations cannot be ignored, ~~and~~ these introduce non-linearities. The question is "What do we know of ~~such~~ complex, multidimensional, time-dependent and non-linear systems?"



The basic answer is that they are in general not nice, in that ~~the~~ time series of the variables that endogenous processes would generate do not fall into a damped, exponential growth or well behaved cycles pattern. Such systems explode or exhibit chaotic or hysterical behavior and can be conducive

to catastrophe. Our world does not exhibit "chaos" often - there seems to be a good deal of coherence to economies and catastrophies are scarce. The problem is to achieve an apparent coherence even though the underlying system if left to "itself" would degenerate in time to an incoherent state; the underlying system needs to be "dominated". We need to get observed coherence out of a system whose internal processes yield incoherence.(2)

There is a paper by Blatt(3) that indicates how a system whose endogenous reactions yield incoherence - in his case explosive cycles - can be constrained to generate numbers which if analysed econometrically lead to the proposition that the endogenous relations must be "damped", i.e., tends toward an equilibrium value.

What Blatt did is set up an accelerator multiplier model whose parameters are known to yield an explosive time series. He also introduces well behaved flows and ceilings. He allowed the endogenously explosive accelerator multiplier and the ceilings and flows to generate numbers. He then used these numbers to determine the parameters of a fitted accelerator multiplier model.

Instead of recapturing the parameters that lead to the known explosive interactions, Blatt's econometrics yields a set of parameters that would make for a damped cycle. The world being analyzed is known to be endogenously explosive, with constraints that contain the tendencies to explode, to become incoherent; the econometrics say the world is an equilibrium seeking apparatus. It is the constraints that "dominate" the thrust towards endogenous incoherence so that the system yields a "pseudo-coherence".

The system therefore consists of endogenous processes and constraints. To see what is going on we can turn to the simple accelerator-multiplier model plus constraints: a model that without the constraints is approaching its fiftieth birthday and with the constraints its thirtieth birthday.[4] As is

well known it takes the form of

$$1) \quad C_t = a_0 + \alpha Y_{t-1}$$

$$2) \quad I_t = b_0 + \beta(Y_{t-1} - Y_{t-2})$$

$$3) \quad Y_t = C_t + I_t$$

so that

$$4) \quad Y_t = a_0 + b_0 + (\alpha + \beta) Y_{t-1} - \beta Y_{t-2}$$

$$\text{or} \quad Yt - (\alpha + \beta) Y_{t-1} + \beta Y_{t-2} = \alpha_0 + b_0$$

The equilibrium value of this system where $Y_t = Y_{t-1} = Y_{t-2} =$

$$5) \quad \bar{Y} = \frac{ao + bo}{1 - \alpha}$$

The equation 4 has a solution which takes the form

$$6) \quad Y_t = \bar{Y}_t + A_1\mu_1^t + A_2\mu_2^t$$

where μ_1 and μ_2 are derived from the parameters α and β and A_1 and A_2 are derived from the initial conditions. We assume values of α and β such that $\mu_1 > \mu_2 > 1$.

[C, I, Y are consumption, investment and income. a_0 and b_0 are parameters whereas α = marginal propensity to consume and β = multiplier coefficient]

$$\bar{Y}_t = Y_o + \lambda \mu_{g_c}^t$$

If the system has a "ceiling" given by $\bar{Y}t = Yo + \lambda\mu^t_{g_c}$ and a floor given by $Y_t = Y_o^* + \lambda_f \mu^t_{g_f}$ $(0 < \lambda_f \leq 1)$, then, if $\mu_1 > \mu_{g_c} > \mu_2$ both A_1 and A_2 are positive and if $\mu_1 > \mu_2 > \mu_{g_c} > 1$, then $A_1 < 0$ and $A_2 > 0$, but $|A_1| < |A_2|$. If $\mu_{g_c} > \mu_1$, then the ceiling never becomes operative, the time series is an unconstrained explosive accelerator model that migrates to a growth rate given by μ_1.

If the system has real $\mu > 1$ (i.e., 1.05 is a 5% growth rate) and if $\mu_1 > \mu_{g_c} > \mu_2$, then the observed "path" will be a constant rate of growth. If $\mu_1 > \mu_2 > \mu_{g_c} > \lambda\mu_{g_f}$, then the observed path will be a constant amplitude cycle that bounces between the ceiling and the floor.

It ~~is possible~~ therefore ~~to get an acceptable~~ time series (monotonic growth ~~and~~ or a constant relative amplitude cycle) ~~out~~ of a process which is

because of
endogenously "explosive" by the impact of ceilings and floors on the combined process.

The system of the accelerator multiplier process with floors and ceilings is piecewise linear with switching points when the floors and ceilings become effective. In economic terms an endogenous process that leads to unacceptable values is constrained by institutions, policy interventions, and social or technical rigidities so that acceptable values are the result. In terms of the formal model [recall that the solution equation $Y_t = A_0\mu_1^t + A_2\mu_2^t$ is a transformation of a second order difference equation $Y_t = a_1Y_{t-1} + a_2Y_{t-2}$] the ceilings and floors impose new initial conditions.

A word about recursive processes of solution equations and initial conditions may be in order. Given the parameters (α and β of equation 4) two values of Y — Y_{t-1} and Y_{t-2} — need to be known to set the process as given by equation 4 in motion.

In equation 6 the two initial conditions are handled as follows:

$$6.1 \qquad Y_{t-2} = Y_0 = A_1\mu_1^0 + A_2\mu_2^0$$

$$Y_0 = A_1 + A_2$$

$$6.2 \qquad Y_{t-1} = Y_1 = A_1\mu_1^1 + A_2\mu_2^1$$

states of the economy. Let us allows 6.1 and 6.2 to
Y_0 and Y_1 being the initial conditions. If we take two "generated" values, Y_n,
and Y_{n-1}, from equations 4 or 6 and use these as initial conditions for determining
A_1 and A_2, we would get

$$6.3 \qquad Y_{n-1} = \bar{A}_1\mu_1^0 + \bar{A}_2\mu_2^0$$

$$6.4 \qquad Y_n = \bar{A}_1\mu_1^1 + \bar{A}_2\mu_2^1$$

and $\bar{A}_1$ will equal $A_1\mu_1^{n-1}$ and $\bar{A}_2 = A_2\mu_2^{n-1}$; the two "sets" 6.1, 6.2 and 6.3, 6.4 will generate identical values for Y_{n+1}, Y_{n+2}, ... *

Footnote to 11.

If Y_0 and Y_1 are the initial conditions then the coefficient $A_1 = \frac{Y_0 u_2 - Y_1}{u_2 - u_1}$ and $A_2 = \frac{Y_0 u_1 - Y_1}{u_1 - u_2}$ and we have

$$\begin{cases} Y_n = (A_1) u_1^n + (A_2) u_2^n \\ Y_{n+1} = (A_1)(u_1)^{n+1} + A_2 u_2^{n+1} \end{cases}$$

If the calculated Y_n, Y_{n+1} are used to obtain the new coefficients $\bar{A}_1$ and $\bar{A}_2$ we set

$$\bar{A}_1 = A_1 u_1^n = \frac{Y_n u_2 - Y_{n+1}}{u_2 - u_1} \quad \text{and}$$

~~$\bar{A}_2 = A_1 u_1^n =$~~

$$\bar{A}_2 = A_2 u_2^n = \frac{Y_n u_1 - Y_{n+1}}{u_1 - u_2}$$

So that $\bar{A}_1 u_1^2 + \bar{A}_2 u_2^2 \equiv A_1 u_1^{n+2} + A_2 u_2^{n+2}$

Then $n+2^{nd}$ would be identical.

$$Y_n = A_1 u_1^n + A_2 u_2^n$$
$$Y_{n+1} = A_1 u_1^{n+1} + A_2 u_2^{n+1}$$

$$Y_n = \bar{A}_1 + \bar{A}_2$$
$$Y_{n+1} = \bar{A}_1 u_1 + \bar{A}_2 u_2$$

$$Y_n u_1 = \bar{A}_1 u_1^{n+1} + \bar{A}_2 u_2^n u_1$$
$$Y_{n+1} = \bar{A}_1 u_1^{n+1} + \bar{A}_2 u_2^{n+1}$$

$$Y_n u_1 - Y_{n+1} = A_2 u_2^n u_1 - A_2 u_2^{n+1}$$
$$= A_2 u_2^n (u_1 - u_2)$$
$$A_2 = \frac{Y_n u_1 - Y_{n+1}}{u_1 - u_2}$$

$$Y_n u_1 = \bar{A}_1 u_1 + \bar{A}_2 u_1$$
$$Y_{n+1} = \bar{A}_1 u_1 + \bar{A}_2 u_2$$

$$Y_n u_1 - Y_{n+1} = \bar{A}_2 u_1 - \bar{A}_2 u_2$$
$$\bar{A}_2 = \frac{Y_n u_1 - Y_{n+1}}{u_1 - u_2}$$

$$\bar{A}_{2n} = \boxed{A_2 u_2^n = \frac{Y_n u_1 - Y_{n+1}}{u_1 - u_2}}$$

$$Y_n u_2 = A_1 u_1^n u_2 + A_2 u_2^{n+1}$$
$$Y_{n+1} = A_1 u_1^{n+1} + A_2 u_2^{n+1}$$

$$Y_n u_2 - Y_{n+1} = A_1 u_1^n u_2 - A_1 u_1^{n+1}$$
$$A_1 = \frac{Y_n u_2 - Y_{n+1}}{u_1^n u_2 - u_1^{n+1}}$$
$$A_1 = \frac{Y_n u_2 - Y_{n+1}}{u_1^n (u_2 - u_1)}$$

$$Y_n u_2 = \bar{A}_1 u_2 + \bar{A}_2 u_2$$
$$Y_{n+1} = \bar{A}_1 u_1 + \bar{A}_2 u_2$$

$$Y_n u_2 - Y_{n+1} = \bar{A}(u_2 - u_1)$$
$$\bar{A}_1 = \frac{Y_n u_2 - Y_{n+1}}{u_2 - u_1}$$

$$A_1 u_1^n = \frac{Y_n u_2 - Y_{n+1}}{u_2 - u_1}$$

$$\bar{A}_1 = A_1 u_1^n$$
$$\bar{A}_2 = A_2 u_1^n$$

$$Y_{n+2} = \bar{A}_1 u_1^2 + \bar{A}_2 u_2^2$$
$$= Y_{n+2} = A_1 u_1^{n+2} + \bar{B} u_2^{n+2}$$

QED

Thus we could "conceive" of the dynamic ~~processes~~ as "one step at a time" processes in which the recent values of the variable are initial conditions for the next value of the variable. A process can be said to be "unconstrained" when the initial conditions for the "next step" are generated by the process and "constrained" when the initial conditions for the "next step" differ from those that the process would have generated. Constrained "processes" reflect either institutions or policies which impact upon variables whose future is determined by the past in such a way that bounds are put on the variables the system realizes.

Thus in models ~~I~~ explored well nigh thirty years ago constraints that reflected the behavior of monetary variables or productive capacity were used to transform endogenously explosive processes into generators of acceptable time series. The monetary variables and productive capacity were modeled as imposing new initial conditions upon the process.

A more overtly non-linear process would have the parameters of the model - the α and β of equation 4 - vary with system behavior or with some external constraint. Thus in an early model R. Goodwin had investment determined by an accelerator such as equation 2, but placed a ceiling on investment capacity, there exists an I_t max.[5] Because of his lag structure ΔY persisted in increasing after I_{max} was achieved, in effect reducing the realized β. By lowering β in this way the explosive process was turned into a damped process. In effect β became a function of ΔY such that if $\Delta Y > \Delta \bar{Y}$ then $d\beta/dt < 0$.

The problem is not in devising a "game" or a "model" that yields apparent coherence out of processes that would endogenously yield incoherence, the problem is to give economic significance to the devices that are used to get these transformations.

In a number of places Prof. Richard Day has explored properties of models that endogenously generate incoherence. These models cannot in general be solved analytically, but runs with varying parameter values and initial conditions are possible. These runs can be studied and ideas about the structures of these relations can be derived. In the case of these models - just like the piecewise linear model - a semblance of coherence can be achieved by appropriate intrusion of initial conditions or institutional arrangements that change parameters. Incoherence can be thwarted by an apt series of interventions.

IV CONJECTURES THAT CAN BE TRANSFORMED INTO THEOREMS

IV. Conjectures that can be Transformed into Theorems

If the internal dynamics of the complex system that is an economy imply that incoherence or a catastrophe will occur, then the on the whole coherence and rarity of catastrophe that are observed implies that the internal dynamics are thwarted. The study of such systems becomes the analysis of the "thwarting systems" - "What is there about the economy that does not allow unbridled scope to the internal dynamics?" becomes the question. The thwarting mechanism is an institutional characteristic. Almost always ~~we can assume~~ the thwarting institutional characteristic or intervention either leads to values of the recursed variable that differs from the generated value or a effects ~~one of the~~ reaction parameters. Sometimes it becomes merely a modeling game by the analyst to determine whether initial conditions or parameter values are changed.

Two theorems (or conjectures) emerge out of the view that the internal dynamics will in time lead to unacceptable system states (catastrophy or incoherence) which differ from the accepted views. The first is an

"anti-laissez faire theorem" and the second is a "limitations upon the attainable" theorem.

The basic "aim" of orthodox allocation theory is to establish Adam Smiths invisible hand "Theorem", that each agent "...intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention" [Wealth of Nations 1b bk IV, ch. 2]. This theorem, ~~much modernized,~~ becomes through the intellectual history of economics the proposition that a competitive equilibrium is a Pareto optimum. The "invisible hand" proposition leads to laissez-faire - where laissez-faire does not unleash ~~successful~~ predators motivated by greed but where market conditions force powerless agents to serve a "social good".

The Anti-Laissez Faire theorem is that "In a world where the internal dynamics imply that coherence will break down (or a catastrophe will occur) a semblance of coherence can be achieved by constraints and interventions." These constraints and intervention ~~can~~ take the form of imposing new initial conditions or affecting market reactions so that parameters change. This is of course what floors and ceilings do in the piecewise linear systems. The theorem is that analogues to floors, ceilings and frequency limitations exist in real world economies and transform the systems that generate incoherence into generaters of well behaved or coherent economies.

The second, or limitation upon performance, theorem follows from the first. If the pursuit of individual gains or well being in the market leads the system to "rush off" into inflation, deflation or rapid oscillatory systems that throws off disparate signals that exceed computation capabilities, then the economy will be moving rapidly away from any well defined notion of "allocation" or "stabilization" efficiency. If there is an

observation time, and less than perfect adjustment ~~for~~ by interventions the system can never be in an optimal alignment. This implies that there is a "practical best" for the economy that ~~can~~ falls short of any abstract best.

These two theorems imply that any success in sustaining coherent growth depends upon the institutional structure and that because the institutional structure and the source of incoherence change or evolve, success will be transitory. A "revolution" like that of Roosevelt's or the "Age of Keynes" ~~from 1946 to 1967~~ will be successful even as the seeds of future failure are ripening within the economy. There is no automatic pilot for the economy.

Secondly because in each epoch the practical best ~~will~~ falls short of a theoretical best, there always seems room for improvement. All too often the "room for improvement" will be along "one" on the efficiency dimensions - and success means that one or more of the other efficiencies is compromised.

V INSTITUTIONS AND THE BEHAVIOR OF COMPLEX SYSTEMS

V. Institutions and the Behavior of Complex Systems

The proposition that emerges from considering complex, non-linear time dependent systems is that observed coherence is due to the interaction of the endogenous dynamic process, that on its own would lead to incoherent behavior, and institutional structures which, at apt times, dominate the endogenous processes in determining what takes place. We know from the mathematics that endogenous interactive processes will, in general, lead to incoherence. We now need to pay attention to institutional structures that contain thrusts toward incoherence so that fully realized breakdowns are scarce.

In the modern American economy ~~the only~~ a reduction of the system to incoherence took place in 1929-33. In some other countries breakdowns toward incoherence have been ~~mainly~~ in the form of inflations. However we may call for a reinterpretation of history. To the extent that the interpretation of

A. Piore-Sabel Conjectures with respect to Labor Markets

In their recent book, The Second Industrial Divide, Piore and Sabel argued that the United States post World War II wage policy consensus was a significant factor in creating the era of apparent tranquil progress that ruled until the late 1960's-early 1970's. The wage policy concensus was that hourly wages should increase each year by a factor that reflected productivity gains plus realized inflation - i.e. the purchasing power of wages should increase by 3% each year. This consensus made for tranquil progress because it held "underconsumption" in check - and to Piore and Sabel underconsumption was one of the causes of the great depression; buoyant worker demand characterized this system. Piore and Sabel also intimated that this trade union settlement forced the banking system to be properly accommodating.

The productivity plus inflation rule for nominal wage changes reflected a view that it was inefficient to rely on competitive market forces to transform falling unit labor costs into lower prices. After all if money wages were constant and product markets were competitive then productivity increases would be translated into falling money prices. The argument has to draw on a proposition that market prices will not adjust to decreasing unit labor costs or that if such adjustments took place there would be adverse consequences.

In practice the wage consensus led to a rule - such as 3% plus inflation - which would transform a shortfall of productivity increase into a rise in product prices. If, for any reason, wage increases exceeds the rate given by productivity and inflation in any one year, then supply conditions would make for further inflation. If inflation takes place, the consensus rule has it the banking system would be accommodative, so that "next" year the inflation plus wage increase would tend to increase.

Thus the institutional structure put in place in the General Motors contract immediately after World War II did no harm and may have done some good in the first era after World War II, but after burst of wage increases in excess of productivity plus inflation rates in 1968-69 the wage process became an engine of inflation. Escalator clauses tend to amplify the dangers of an inflationary instability being built into the system. An institutional structure may be a stability enhancing system in one set of circumstances and instability enhancing in another.

B. Market Power and Financial Structures

In our modern world, successful production, administration, communication distribution and transportation processes often use very expensive and long-lifed capital assets. Often does not mean always. What we may call the "Emilian Way" of small sophisticated firms can coexist with and prosper alongside operations that require expensive capital because of technology or the scale of operations.

Expensive, long-lifed capital assets require financing. In some capitalist economies - such as Italy - many of the industries that require expensive, long-lifed capital assets are publically owned and externally financed by means of government debts. In the United States almost all such industries are private and in many cases there are alternative suppliers of the services or goods.

In the case of the Railroads - when J. P. Morgan was riding high - it was discovered that for capital intensive industries intense competition that forces price to marginal cost will not yield enough cash to validate bonds or the prices paid for building the asset. This intense competition would result from either "overinvestment" in a regime of decentralized markets or from the

impact of recessions upon the demand for ~~the industries~~ output.

The banker's interest in business is for the cash flows to be large enough to validate debts, debts stated in "nominal" terms. Such debt validation is possible for productions with constant or diminishing marginal costs if and only if price exceeds marginal costs. Intense competition, in periods of excess supply, must not be allowed to push price to marginal cost. Bankers who take their responsibilities to the holders of instruments they put out or sell seriously will not finance industries which require expensive capital assets unless there is some believable guarantee that price will not fall to marginal cost.

Such a guarantee can take two forms: one is to guarantee that significant excess capacity will not arise and the second is to possess market power either because of the non-competition nature of the market (monopoly, oligopoly) or because the industry is regulated. Individual units cannot guarantee that aggregate demand will be adequate, therefore bankers insist on market power.

Thus monopoly and regulation often ~~of industry~~ reflect bankers' needs for devices that limit their borrowing clients exposure to downside profit risks. The question is whether the financing efficiency thus gained - which facilitates capital intensive investment - more than offsets the allocational inefficiency of non-competitive industries and regulated monopolies. In Schumpeter's vision of accumulation and innovation, technical dynamism requires that bankers and business men cooperate in forcing the economy out of the path that leads to simple reproduction. In the view that ignores the processes by which accumulation is financed, the market interference of regulation and oligopoly leads to allocational inefficiency.

The market power - whether through oligopoly or regulation - solution to the problem of protecting finances against downside exposure loses some of its force when fiscal and monetary intervention succeeds in maintaining aggregate demand and aggregate profits. With demand maintained and prices stabilized through regulation or oligopoly interactions, profits are higher than anticipated and unused market power exists. As a result of the unusued market power, rising costs will not decrease profits. A situation in which the unused market power can be used as a basis of wage increases is brought into being.

The American automobile and steel industries are examples of shared monopolies in which unused market power was translated into worker wages and benefits. This led to a cost structure which is untenable in a world with trade. The problem of how to meet competition when market power is eroded may require a reconsideration of the standard "~~force~~ fee trade argument". The institutional structure that emerged when the issue was the financing of capital intensive productions in a world where finance required protection through market structures against aggregate demand failures can be counterproductive in a world where such demand failures do not occur and the monopoly power that supported favorable wages is eroded.

C. Lender of Last Resourt Interventions

Both monetarism and the orthodox Keynesianism that ignores the historical period in which The General Theory was written are alike in that they emphasize the Central Bank as the creator of money rather than the Central Bank as the lender of last resort. In ~~May of 1985~~ the late 1980's, with the recent experience of bank and thrift institution failures that have led to various central bank

refinancing, it is not necessary to go into any abstract discussion of a lender-of-last resort intervention; we need just point to or describe what happened in Mexico, Argentina, Continental Illinois, Maryland, Ohio, etc....

What we have are financial systems whose internal dynamics and interactions, with business that needs to finance control over capital assets and households that profess to hold indirect or protected assets, leads to situations in which a collapse of asset values, financing of activity and therefore of income and employment seems imminent. Over the years the Central Banks have developed interventions which do not permit realized values to represent the unconstrained dynamics of the system. All we have to do is recall Irving Fisher's description of a debt deflation process to recognize the way in which central banking intervenes in the process to abort extreme consequences.

If there is any part of the economic process and any period in economic experience where overt intervention, in order to prevent or dominate what market processes would generate, is accepted, it is when lender of last resort interventions occur. Even though Central Banks and lender of last resort interventions are common to our two economies, the institutions and the form the intervention takes is quite different. In particular the existence of government "holding companies" mean that intervention in Italy is often at the firm level whereas in the United States the intervention is almost always (Chrysler and the Railroads of the Northeast are the major exception) at the financial institution level. Whereas the intervention in Italy at the firm level may not have any monetary policy implications, the interventions at the financial institution or financial market level in the United States affect the reserve base of banks and the interest rate structure. At times the

Federal Reserve's reactions to what it interpreted is an incipient financial crisis led to both a refinancing of threatened organizations and a significant easing or accommodative stance in its monetary policy actions.

VI CONCLUSION

Conclusion

From the argument it follows that the "priors" that should guide ~~our~~ research are:

1) The interactions within a complex economic system lead to the endogenous generation of intermittent incoherence and

2) Incoherence is rarely observed in the economy because the thrust to incoherence is aborted or contained by institutional constraints or policy interventions, either automatic or discretionary.

These priors mean that a progressive research strategy will have both an abstract and an institutional program. The abstract program will be to show how strong or special are the assumptions that lead to the equilibrium result and how ~~any~~ natural economic ~~relaxation of these strong~~ assumptions leads to the endogenous generation of intermittent incoherence. Furthermore the Blatt findings ~~may~~ mean that econometric research in macroeconometrics ~~will~~ tend to validate the researchers priors, and not tell us much about the economy. Means that 'econometrics' needs to be redone in the light of the alternative view.

The institutional research program needs to study the ~~institutions of the~~ financial, labor and technology markets to see how they effectively act to constrain the incoherence breeding processes that are natural to complex systems. Innovation in technology, in finance and in labor markets are often incoherence inducing - perhaps more so in technology and finance than in labor. In order to study the impact of institutions it is necessary to ~~have~~ observed institutional differences. Thus comparative institutional studies

side to the

within a framework in which institutions differ is an essential part of a serious research agenda.

The Schumpeter vision in which finance and innovation are closely linked is especially relevant to the study of instability. Schumpeter's vision - as modified by later Keynesian and Kaleckian ideas - has a mass of profits determined by aggregate variables such as investment, government deficits and the foreign trade surplus (neo-mercantalism) and various capitals (ability to finance) that compete for shares of this mass. Innovations in technology, in finance, in the organization and compensation of labor are devices used by capitals as they compete for profits. The aim of the

But my task is to raise the curtain - not to draw final conclusions. There is a serious research program which I hope we are starting: "How do the actual institutions of capitalism affect the stability and growth of the economy, given that we know that complex systems should by their own internal dynamics degenerate into incoherent behavior?" To do economics without equilibrium, even as the end results of processes and constraints is a pseudo-equilibrium, is the challenge we face.

entrepreneurial thrust is to gain market power: the purpose of market power is to gain an advantage in the quest for profits. An understanding of the changing institutional structure ~~and~~ in terms of which the unchanging Capitalist phenomena - the competition among capitals for profits - is needed if we are to make progress in achieving some of the efficiencies which have been neglected in the recent search for allocational efficiency