Selected Papers of Beijing Forum 2009

Economic Theory and the Financial Crisis

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I want to probe in the role of the market in allocating resources in this very preliminary essay. One does not have to study deeply to that the failure of markets for various kinds of derivative securities to perform properly is an essential element of the current financial crisis.

Actually, financial crises are not a new phenomenon. The history of capitalism has been marked by repeated collapses of the financial system, situations in which the "markets" for loans disappear for extensive periods of time. The 18th century saw some bubbles, but these might not be quite modern. But from 1819 on, there have a succession of failures of banks and other financial institutions. These have typically been unpredicted and did not correspond in time to any particular exogenous event (e.g., wars). Economists from John Stuart Mill (1848) on did recognize the phenomenon. But the discussion was and is not at all integrated with the general exposition of classical economics. No one could be a more vigorous advocate of unrestrained markets than Milton Friedman; yet, to my reading, the account that he and Anna Schwartz gave of monetary developments in the United States and particularly with regard to the Great Depression emphasizes, not prices, not even interest rates, but the supply of money, and, by inference, of liquidity. (Friedman and Schwartz [1963]).

I start with the neoclassical general equilibrium framework, to which I have given a good deal of attention and effort. I seek to identify a possible point at which it fails to supply a coherent theory of securities markets and so might possibly lead to some understanding of the repeated crises of the financial system underlying the development of capitalism.

I. GENERAL EQUILIBRIUM AND CREDIT INSTRUMENTS

The concept of general equilibrium has always been implicit in any serious use of standard economic analysis, but it became explicit in the work of Léon Walras [1874, 1877]. The elements of the analysis are competitive markets in the individual commodities, each characterized by a large numbers of participants on both sides, all facing the same price, and by market clearing. Under these assumptions, there is no question of liquidity; any individual, taken to be small compared with the total market, can buy or sell at the unique market price. Money plays no essential role, except as a useful tool of accounting.

The markets are linked because the same individuals appear on all or at least many markets and make choices as consumers or producers based on all prices. Hence, the price of one commodity affects market

behavior on all other markets. Under these and other conditions, some remarkable theoretical results have been obtained. There will be a set of prices (possibly not unique) such that supply equals demand on all markets. Further, assume that individual behavior is rational, in the sense that individuals in these markets are maximizing the utility they derive from the goods they acquire. Then the allocation achieved at a competitive equilibrium is efficient in a well-defined sense. The analysis was initially static in nature, dealing with a single period. But a capitalist system is intrinsically forward-looking. Many economic decisions have implications for the future as well as the present and concern the trade-off between the two. Saving is a trade-off between present and future consumption. Investment is an expenditure today with a view to output at one or more points in the future.

Hicks's Value and Capital [1939] brought a simple integration of general equilibrium theory with the theory of supply and demand of capital to the attention of the world of economists. He recognized that goods to be supplied in the future were different from those supplied now, even if physically equivalent. If a market were created for each dated good, then, for example, a steel firm would buy a blast furnace today and simultaneously sell steel for delivery in many subsequent years. It would thus know today its stream of future profits and choose today its inputs and outputs in the present and future so as to maximize total profits. (The price today of a future delivery is what would ordinarily be interpreted as a discounted price.)

If all these markets existed, all the previous analysis of the static market would be applicable. Prices that would clear all markets would exist, and the resulting allocations would be optimal.

This description of the economy fails to conform with everyday observation. Markets for future delivery exist only to a very limited extent and only for a specialized range of commodities. We do have futures markets in agricultural commodities and in some minerals but not in manufactured goods. More importantly, we also have markets which trade, not ordinary goods, but various forms of money at different points of time, i.e., the whole panoply of credit instruments.

Hicks was perfectly aware of this failure. He suggested that individuals form expectations of future prices and then prepare plans today based on current prices and expected future prices. Only the current markets, including credit markets, are active and equilibrate (so-called temporary equilibrium). Provision for the future can take the forms of durable goods and of credit instruments (loans and bonds).

There is no intrinsic reason so far addressed that insures that different economic agents have the same expectations. But the efficiency characteristics of markets depend on the assumption that all individuals face the same trade-offs, i.e., the same relative prices. Hence, there is no guarantee of efficiency in this broader approach to general equilibrium over time.

There is one assumption which Hicks mentions and which, in effect, was given much greater emphasis by Arrow and Debreu [1954]. This is the assumption of perfect foresight; individuals predict future prices correctly. This assumption is consistent, as was demonstrated, but it ascribes an econometric ability to economic agents much beyond that of academics. In principle, it requires that all agents know the utility functions and production possibility sets of all other agents. This condition is not only empirically false; it is also inconsistent with one of the chief claims of economists, that efficiency can be achieved by trading among individuals who know only about their own tastes and productive capabilities.

Once it is recognized that a great deal of allocation takes place on the basis, not of markets, but of expectations about future markets, two questions emerge: why don't the missing markets come into being, and what are the implications of expectations-driven allocations? I here intend only to broach these questions and make a few preliminary remarks towards an analysis.

One obvious explanation for the non-existence of futures markets is the uncertainty about the future, There are many causes for uncertainty, but one of great importance is surely uncertainty about technological developments. To make a contract now for future delivery at a given price bears a risk because technological change may make the cost different from that expected. Another risk may be the future emergence of new products whose qualities are random variables from today's viewpoint.

That uncertainty of the future is a significant factor in affecting the outcomes of current markets was long understood in a general way, but there was no systematic way to incorporate uncertainty into the

framework of general equilibrium theory. I introduced one approach, derived from the usual formulations of probability theory and statistical decision theory (Arrow [1953, 1963-4]), subsequently extended by Debreu [1959 Chapter VII].

In effect, I assumed that the market trades in insurance policies on all the factors outside the economic system which affects its performance. These factors will especially include changes in technology but also changes in tastes and effects of storms and other alterations in nature which affect the running of the economy,

With this reinterpretation, the standard apparatus of general equilibrium theory could be used to demonstrate existence and efficiency of equilibrium. I also suggested a role for securities (payable in money, at least in the sense of a unit of account). Suppose individuals had what has been referred to as contingent perfect foresight, that is, the ability to predict the prices that would prevail for a given set of external events, then it would be sufficient to have securities paid in money contingent on states of nature. These securities would be very much like the insurance policies we are well acquainted with.

There are indeed a large number of securities with payment conditional on some events. Apart from standard insurance policies, there are common stocks, clearly very numerous. In addition, corporate bonds and bank loans have payments that are nominally fixed in time and amount, but it is fully understood that there is a risk of default, an event which is contingent on some events. What is noteworthy, however, is that the payments on these securities are not contingent on external events. The payments are determined at least in part by economic variables within the system, prices but also quantities. For example, a firm will fail to repay a bond or will pass a dividend when the input prices are high relative to the output prices.

II. LIMITED INFORMATION OF ECONOMIC AGENTS

Probably the most important innovation in economic theory in the last fifty years has been the emphasis on what has been called asymmetric information. The term, "information," is properly and appropriately used in the sense given by mathematical statistics or communication theory: an observation which changes beliefs. Different individuals who are trading with each other have access to different information; they have varying life experiences and varying opportunities to make observations. A number of economists came to stress this concept from varying points of view; I myself came to it by considering the economics of medical care (Arrow [1963]; for a general survey, see Laffont and Martimort [2002]) Insurance companies had long understood the consequences of asymmetry of information under such headings as, "moral hazard," and, "adverse selection." To illustrate, an insurance company cannot completely check whether a householder has taken adequate care to prevent fire or whether a physician has performed more diagnostic tests than necessary; therefore, it is likely that costs are not held to a minimum. This is called, "moral hazard." "Adverse selection" occurs when those with the greatest likelihood of surviving take out annuities or when people who realize that they are likely to be sick take out more medical insurance. In both cases, the insurer does not have the information available to the insured. These phenomena also occur in financial transactions; the risks are better known to one party than the other.

It is clear that the presence of asymmetric information creates difficulties with the allocation of risks through the market. Some possible damages will not be insured against. In other cases, the market participants will be inferring what is known by the market behavior itself. I.e., if prices of securities or houses are going up for reasons obscure to some, they may infer that others know reasons to be optimistic and so buy, and similarly on the downside. Markets may disappear or at any rate perform poorly in distributing risks.

III. INFORMATION AS A COMMODITY

Clearly, information is of the utmost importance in making economic decisions, especially when it comes to securities or other assets whose value depends on events not yet known. Now the distribution of information cannot simply be taken as given. On the contrary, information can be acquired at some cost. For example, the physician acquires information by attending medical school, by his subsequent residencies, and from his own practice. He or she illustrates the special properties of information as a commodity. The same information is used over and over again; unlike other inputs, it is not consumed by being used. This property implies that it is efficient to specialize. It does not pay everyone to acquire this information, but only a number needed to supply the necessary services.

Bankers have traditionally supplied this function in the financial world. Here, the basic information is training and experience, permitting the evaluation of specific information about potential borrowers. The relation ceases to be easily described by a market, because each extension of credit involves knowledge about specific borrowers.

There is therefore a tendency to small numbers, to the absence of markets in the normal sense. Consequently, there is a set of assets whose tradability is limited and so of limited liquidity. This in turn means that holding money begins to have a value, since other assets are not easily used to purchase other goods.

The advantages of marketization remain real, so that there are recurrent attempts to revive it, as with mortgage-backed securities. But the additional complications means that there is a degradation of information. These remarks point to some of the tensions marking financial markets recurrently in the history of capitalism.

IV. INEFFICIENT INCENTIVES: AN ENDEMIC PROPERTY OF CAPITALISM?

In the discussion of the current financial crisis, Alan Greenspan, former Chairman of the United States Federal Reserve system, raised a very pertinent question: why did the financial concerns make such risky loans? They had obvious incentives not to put themselves at risk; they would be the losers if things turned out badly, as they did. Also, they had as much information as anyone could have about the risks; this was not a case of ill-informed speculators.

One possibility, of course, is that suggested by the behavioral movement in modern economics: the financiers were subject to cognitive biases. Because of the specialization induced by the nature of information as discussed in the last section, the transactions were, in some sense, large on the scale of the market and so had important consequences for the system.

However, there is an alternative view, suggested by many in the newspapers and in academic circles, that, given the incentives, the agents were behaving rationally. The root of the matter is that liabilities are limited from below. A firm can go bankrupt, but that is the worst that can happen to it. Similarly, an executive of a company can at worst be dismissed. The extra bonuses compensating him or her for performance in the event that things went well are not paid back in bad times. As a result, a risky investment that is socially unprofitable (a negative expected value or a positive expected value insufficient to compensate for the market-determined risk level) may be privately rational for the decision-maker, because the latter will not bear all the negative consequences. Arguments of this type were already raised in connection with a previous financial disturbance, the savings and loan crisis of the 1980s (Kane [1989]).

This incentive problem is intrinsic to the nature of modern capitalism. It is built into the concept of limited liability. Obviously, one aim of this policy is to increase the ability to take risks. The only question is whether, in a world of imperfect and asymmetric information, it does not lead to excessive risk-bearing.

V. POLICY IMPLICATIONS

Financial crises have been costly to the economy, though not all equally. The present one is very severe indeed. The current recession has been deep and prolonged in the United States and Europe.   It raises the question, what can be done to prevent their future occurrence of similar crises or at least limit the damage they do.

There are (at least) two possible approaches. One is to change the incentives of the individuals involved. But in fact those most responsible for the issuance of derivative securities themselves lost heavily. They did not, to be sure, bear nearly all the losses they inflicted on society, but they bore enough to be hurt badly. Great firms which have been central in finance for a century or more have disappeared. No doubt something can be done to improve the incentive aspects of compensation. Payment of bonuses could be set aside for several years to see if the results will remain favorable. This will prevent some of the more short-sighted transactions. But the needs for risk-taking in a progressive capitalist economy will prevent any great erosion of limited liability in some form or another.

The alternative possible orientation for policy is a new set of general financial regulations. Specifically, it is to limit the spread of disturbances, not to prevent their origination. We cannot and do not want to prevent well-informed people from losing their own money in speculation. The spread of failure from the individual to the economy as a whole is governed by the use of borrowed money, what is called, leverage. This can be controlled by limiting leverage, that is, requiring investors to put up a substantial amount of their own money and limiting the extent to which they can use borrowed money. Such regulations were introduced in the stock market as early as 1934 in the United States, during the Great Depression, and such regulations are common for commercial banks. They have to be extended to all forms of investment.

The great variety of financial relations makes such regulations difficult to formulate and difficult to enforce. They will require constant study and vigilance to reformulate them to meet the clever responses of the financial community. But I have little doubt that, once the commitment to limit leverage is made, it can be enforced and can limit the damage arising from the financial markets.

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