

CENTRAL BANK BEHAVIOR IN TIMES OF
FINANCIAL CRISIS

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INTRODUCTION

The first question should be “What is the Primary Function of A Central Bank?” Once we can agree on this question then we can discuss how, in pursuit of this function, the central bank should behave.

Keynes (1936, p. 383) wrote: “the ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful that is commonly understood. Indeed the world is ruled by little else. Practical men, who believe themselves to be quite exempt from intellectual influences, are usually the slave of some defunct economist.” The question of the primary function of a Central Bank illustrates this Keynes idea graphically for the answer depends on what economic theory one utilizes.

There are two fundamentally alternative economic theories that attempt to explain the operation of a capitalist economy, its central bank and its financial markets. These are:

- (1) the classical economic theory and its many variants such as “the theory of efficient markets”, “classical or neoclassical theory”, “general equilibrium theory”, “dynamic general equilibrium theory” or “mainstream economic theory”. The mantra of this analytical system is that free markets can cure any economic problem that may arise, while government interference always cause economic problems. In other words, government economic policy is the problem, the free market is the solution.
- (2) the Keynes liquidity theory of an entrepreneurial economy . The conclusions of this analysis is that government can cure, with cooperation of private industry and households, economic flaws inherent in the operation of a capitalist economy especially when unfettered greed or fear is permitted to dominate economic decisions.

Keynes stated that classical economists:

Resemble Euclidean Geometers in a non Euclidean world who, discovering that in experience straight lines apparently parallel often meet, rebuke the lines for not keeping straight – as the only remedy for the unfortunate collisions which are occurring. Yet in truth there is no remedy except to throw over the axiom of parallels and to work out a non Euclidean geometry. Something similar is required today in economics.

To create a nonEuclidean economics to explain why these unemployment “collisions” and economic and financial crises occur in the world of experience Keynes had to deny (“throw over”) the relevance of several classical axioms namely the ergodic axiom the neutral money axiom, and the gross substitution axiom.

The classical ergodic axiom which assumes that the future is known and can be calculated as the statistical shadow of the past was one of the most important classical assertions that Keynes rejected. Instead Keynes argued that when crucial economic decisions had to be made, decision makers could not merely assume that the future can be reduced to quantifiable risks calculated from already existing market data.

A second and just as important classical axiom is the “neutral money axiom”. For purposes of discussing the function of a central bank we will focus in on the neutral money axiom.

AXIOMS AND THEORY BUILDING

The best way to evaluate any economic theory is to consider the theorist as if she is a magician. Theorists rarely make logical errors in moving from axioms to conclusions, any more than professional prestidigitators drop the deck of cards while performing a card trick. Today’s economic theorists are proficient at creating the illusion of pulling policy conclusion rabbits out of their black hat mathematical model of the economy. The more surprising the policy rabbits pulled from the hat, the greater the audience enjoyment of the economist’s performance and the greater the applause and rewards.¹

A careful examination of the rabbits that a classical theory economist- magician put into the hat backstage is required to evaluate the relevance of the policy rabbits pulled from the black hat on stage. The policy rabbits pulled from the classical economists’ hat cannot be criticized if the axiomatic rabbits initially being put into the hat have been judged acceptable by the audience. In other words, before accepting the conclusions of any economist’s theory as applicable to the world in which we live, the careful student should always examine and be prepared to criticize the applicability of the fundamental axioms of the theory. In the absence of any mistake in logic, the axioms of the theory determine its conclusions. Remember, from the theorist’s standpoint, an axiom is defined as “a statement universally accepted as true ... a statement that needs no proof because its truth is obvious.”

THE NEUTRAL MONEY AXIOM

Neutral money was a fundamental axiom of nineteenth century classical theory. The neutral money postulate is that changes in the quantity of money in the economy have absolutely no effects on the aggregate level of employment and production in the system. In a neutral money economy, employment and output are determined solely by non-monetary factors in the economic system. By the early twentieth century, this neutrality of money presumption became one of the basic axioms of the prevailing orthodoxy in economics textbooks. Even today, neutral money remains one of the fundamental axioms of modern mainstream economic theory. For those who are trained in classical economic theory, therefore, the neutrality of money is an article of faith, requiring no proof or justification.

For example, in a moment of surprising candor, Professor Oliver Blanchard, a prominent member of the economics faculty of the Massachusetts Institute of Technology and the prestigious National Bureau of Economic Research, has characterized all the macroeconomic models widely used by mainstream economists as follows: “All the models we have seen impose the neutrality of money as a maintained assumption. This is very much a matter of faith, based on theoretical considerations rather than on empirical evidence” (Blanchard, 1990, p. 828).

In other words, even though there is no empirical evidence underlying the fundamental classical presumption of neutral money, all mainstream macroeconomic models including those used by the Federal Reserve, the Council of Economic Advisors, the National Bureau of Economic Research, etc. are based on the neutral money axiom. This unshakable belief in neutral money is merely the creed (dogma) of mainstream economists that permits them to claim that if governments individually and via international cooperation remove all regulation from markets, i.e., “liberalize all markets”, then the national and global economy will achieve its goal of full employment prosperity. Since this conclusion requires the neutral money axiom as a foundation, mainstream economists are assuming what they pretend to be proving.²

In 1933 Keynes explicitly indicated that the “monetary theory of production” that he was developing explicitly rejected the classical neutrality of money assumption as applicable in either the short-run or the long-run. Keynes (1933, pp.408-11) wrote, “An economy which uses money but uses it merely as a neutral link between transactions in real things and real assets and does not allow it to enter into motives or decisions, might be called - for want of a better name - a real-exchange economy. The theory which I desiderate would deal, in contradistinction to this, with an economy in which money plays a part of its own and affects motives and decisions and is, in short, one of the operative factors in the situation, so that the course of events cannot be predicted either in the long period or in the short, without a knowledge of the behavior of money between the first state and the last. And it is this which we ought to mean when we speak of a monetary economy ... Booms and depressions are peculiar to an economy in which ... money is not neutral. I believe that the next task is to work out in some detail such a monetary theory of production. That is the task on which I am now occupying myself in some confidence

that I am not wasting my time.”

Here, in Keynes’s own words, is his claim that a theory of production for a money-using economy must reject what mainstream economists have always believed is a "universal truth," the neutrality of money. This neutrality axiom had been the foundation of classical economic theory for 125 years before Keynes. No wonder Keynes’s *General Theory* was considered heretical by most of his professional colleagues who were wedded to the classical analysis. Keynes was delivering a mortal blow to the very foundation of classical faith. No wonder Keynes’s original analysis and the further elaboration and evolution of Keynes’s system by Post Keynesian economists in recent decades has not been understood by the majority of economists who, as Professor Blanchard has expressly noted, are ideologically bonded to the classical traditional axiom of neutral money.

If the neutral money axiom is a fundamental belief of classical theory, then changes in the quantity of money can not affect real output and employment. Consequently the only thing that changes in the quantity of money can affect is the price level, given the classical assumption that output will (at least in the long run) be at the full employment level. Moreover if we add rational expectations to the model – as both New Keynesians and New Classical Economists do, then even in the short run, output will follow the full employment long run trend.

Since all economist recognize that the Central bank is the legal Monetary Authority which, if it is independent of politicians, then the primary function, and the only thing a central bank can do in a classical theory neutral money capitalist economy is to affect the level of prices. Thus, classical theorists argue that an independent central bank should target the rate of inflation. I wish to call your attention to the fact that this “targeting function” is an assumption of classical theory and not a conclusion.

Another basic axiom that creates a difference between these two alternative theories that explain the operations of a capitalist economy is how each theory treats knowledge about future outcomes that decision makers have when making today’s decisions. In essence, the classical efficient market theory presumes that by one method or another decision makers today do, or at least can, obtain reliable quantitative knowledge about the risks regarding future outcomes of any decision made today. Given this quantitative knowledge regarding future outcomes, the only economic decision that today’s market participants have to solve is the allocation of today’s resources to produce the most valuable quantitative outcomes today and all future dates.

The Keynes liquidity theory on the other hand, presumes that decision makers “know” that they do not, and can not, know the future outcome of certain crucial economic decisions made today. Thus the Keynes theory explains how the capitalist economic system creates institutions that permit decision makers to deal with an uncertain future while making allocative decisions and then sleep at night. The Keynes theory would suggest that instead of attempting to quantify the unquantifiable systemic future risks, that society develop institutions that stabilize and make financial markets more orderly.

The classical theory presumption that the future is known or at least knowable is the foundation all of today's efficient market theories. For example, the mathematically sophisticated Arrow-Debreu general equilibrium model is the basic analytical framework upon which most mathematical computer economic models used by economists are based. This Arrow-Debreu presumption is that markets exist today to permit participants to buy and sell all the products and services that will be delivered today and at every date in the future. Thus at the initial instant of time, it is presumed that all market participants enter into transactions for the purchases and sales of all products and services not only for delivery today but for delivery for all future dates till the end of time. In its extreme conceptualization, this complex mathematical model implies that buyers today not only know what goods and services they are going to demand in the market today, tomorrow and every future date for the rest of their lives, but today they also "know" what their grandchildren, great grandchildren, etc will want to buy and sell decades and centuries from today. If efficient markets existed when Adam and Eve were banished from the Garden of Eden, then Adam and Eve, being ancestors to all of us alive today, would have already entered into a future order to purchase dinner for all participants in this conference. Only the high level of mathematics and abstraction of this classical theory can bury its impossible axiomatic foundation.

This classical economic theory assumes a complete set of free markets system in a world where everyone "knows" the future, or at least has "rational expectations" about the future (This includes both influential New Classical and New Keynesian theorists). In such a theory everyone is aware of all intertemporal budget constraints and no one exceeds their budget constraint boundaries no matter what contingencies may arise, therefore loan defaults, insolvencies, and bankruptcies cannot occur – and everyone in the model knows they can not occur. Logically then individual and market illiquidity problems cannot occur. Accordingly, these classical theorists cannot provide an economic answer for how to clean up the mess when insolvency and illiquidity problems create a financial crisis in the real world.

Nevertheless mainstream economists still believe in the efficiency of free markets and the ability of decision makers to correctly quantify future systemic financial risks of today's portfolio decisions. To salvage their efficient market conclusions in the absence of a complete markets paradigm, most economists assume that market participants possess "rational expectations" regarding all future possible outcomes of any decision made today. Lucas's theory of rational expectations asserts that although individuals presumably make decisions based on their subjective probability distributions, nevertheless if expectations are to be rational these subjective distributions must be equal to the objective probability distributions that will govern all possible outcomes at any particular future date. In other words, somehow today's rational market participants possess statistically reliable information regarding the probability distribution of the universe of future events that will occur on any specific future date.

To obtain a reliable probability distribution about a future universe of events, the decision maker should draw a random sample from that future universe. Then the decision maker can analyze this sample from the future to calculate statistically reliable information

about the mean, standard deviation, etc. of this future population. Thus, the analyst can reduce uncertainty about prospective outcomes to a future of actuarial certainties expressed as objective probabilistic risks – though still subject to Type I and Type II errors.

Since drawing a sample from the future is not possible, efficient market theorists must presume that probabilities calculated from already existing market data is equivalent to drawing a sample from markets that will exist in the future. This presumption is known as the ergodic axiom which in essence asserts that the future is merely the statistical shadow of the past. Only if this ergodic axiom is accepted as a universal truth, will calculating probability distributions (risks) on the basis of historical market data be statistically equivalent to drawing and analyzing samples from the future. Only under the ergodic axiom is the past, the present, and the future all rolled up into one!

Those who claim that economics is a “hard science” like physics or astronomy argue that the ergodic axiom must be the foundation of the economists’ model. An axiom is defined as a universal truth that needs not be proved. The classical ergodic axiom permits economists to claim that probabilities calculated from past and current market data provide reliable actuarial knowledge about the future. In other words, the future is merely probabilistically risky but not uncertain. In 1969, for example, prize economist Paul Samuelson (1969), who is often thought to be the originator of post-Second-World-War Keynesianism, wrote that if economists hope to remove economics from the realm of history and move it into the “realm of science” we must impose what Samuelson called the “ergodic hypothesis.”

The assumption that the economy is governed by an ergodic stochastic process means that the future path of the economy is already predetermined and cannot be changed by human action today. Astronomers insist that the future path of the planets around the sun and the moon around the earth has been predetermined since the moment of the Big Bang beginning of the universe. Nothing humans can do can change the predetermined path of these heavenly bodies. This “Big Bang” astronomy theory means that the “hard science” of astronomy relies on the ergodic axiom. Consequently by using past measurements of the speed and direction of heavenly bodies by observations, astronomical scientists can accurately predict the time (usually within seconds) of when the next solar eclipse will be observable on the earth.

Assuming that this hard science astronomy is applicable to the heavenly bodies of our universe, then it should be obvious that the United States Congress cannot pass legislation that will actually prevent future solar eclipses from occurring even if the legislation is designed to obtain more sunshine to improve agriculture crop production. In a similar vein, if, as Samuelson claims, economics is a “hard science” based on the ergodic axiom, then Congress can neither pass a law preventing the next eclipse nor pass a law preventing unemployment and recession that are already predetermined in the future path of the economy. The result is a belief in a laissez-faire non government intervention policy as the only correct policy.

CLASSICAL THEORISTS VS. KEYNES ON THE REALITY OF ASSUMPTIONS

If Keynes was alive today I think he might have called this theory of efficient markets a case of “weapons of math destruction”. Yet, economist Robert Lucas [1981, p. 287] has boosted that the axioms underlying classical economics are “artificial, abstract, patently unreal”. But like, Samuelson, Lucas insists such unreal assumptions are the only scientific method of doing economics. Lucas insists that “Progress in economic thinking means getting better and better abstract, analogue models, not better verbal observations about the real world” (Lucas, 1981, p. 276). The rationale underlying this argument is that these unrealistic assumptions make the problem more tractable and, with the aid of a computer, the analyst can then predict the future. Never mind that the prediction might be disastrously wrong.

Computer based mathematical versions of classical efficient market theory involving thousands of variables and an equation for each variable have been put forth as a hard science description of our economic system that, at an point of time, simultaneously determines the price and output of every item that is traded in the economic system. For many even identifying the fundamental axioms buried under all the mathematical debris is an impossible task. Moreover, the fact that computers can manipulate all that mathematics gives the results an aura of scientific truth. How can a computer print-out be wrong?

In a 2009 article entitled “Probably Wrong – Misapplications of Probability and Statistics in Real Life Uncertainty”, Oxford University’s Peter Taylor and David Shipley of MAP Underwriting Agencies, Lloyd’s of London suggests why all these computer print-out are wrong. Taylor and Shipley have written; “There are lies, damned lies, and statistics..Probability and Statistics just don’t feel right for many problems. They give the impression of allowing fairly for the eventualities and then something unexpected happens. Those of a more pragmatic nature would want some measure of credibility such as the extent of applicability to a theory or a problem. In complex systems, the predictability that is so successful in the controlled worlds of the lab and engineering has not worked and yet theories claiming predictability have misled policy makers and continue to do so. We may even have to own up to not having an appropriate model at all, surely a modern-day heresy”

Taylor and Shipley argue that we should learn from th current economic and financial crisis that:

As investors, never trust a manager who says he has a superior mathematical model. As mangers leave room in your business model for the unexpected.. As regulators focus on management’s ability to understand real risk exposure, rather than the comfort blanket of a model.. [and] As modelers, encourage critical awareness that the model may not represent all the relevant mechanisms for the process under consideration.

In the introduction to his book *Against The Gods*, a treatise that deals with the questions

of relevance of risk management techniques on Wall Street, Peter L. Bernstein writes:

The story that I have to tell is marked all the way through by a persistent tension between those who assert that the best decisions are based on quantification and numbers, determined by the [statistical] patterns of the past, and those who based their decisions on a more subjective degrees of belief about the uncertain future. This is a controversy that has never been resolved.

One would hope that the empirical evidence of the collapse of those “masters of the economic universe “ that have dominate Wall Street machinations for the last three decades has at least created doubt regarding the applicability of classical ergodic theory to our economic world. Even Alan Greenspan seems to be having second thoughts although he still has not completely changed his tune.

Keynes’s liquidity theory for dealing with the uncertain future

John Maynard Keynes’s ideas support Bernstein’s latter group. Keynes specifically argued that the uncertainty of the economic future cannot be resolved by looking at statistical patterns of the past. Keynes’s believed that today’s economic decisions regarding spending and saving depend on individuals’ subjective degree of belief regarding possible future events.

Although in his discussion of uncertainty Keynes did not know or use the dichotomy between an ergodic and nonergodic stochastic system in his criticism of Tinbergen’s methodology Keynes notes that economic time series cannot be stationary because “the economic environment is not homogeneous over a period of time”. Nonstationarity is a sufficient but not a necessary condition for a nonergodic stochastic process. Accordingly, Keynes was implicitly arguing that economic processes over time occur in a nonergodic economic environment.

Taming uncertainty in Keynes’s liquidity theory

For decisions that involved potential large spending outflows or possible large income inflows that span a significant length of time, people “know” that they do not know what the future will be. Nevertheless, society has attempted to create institutions that will provide people with some control over their uncertain economic destinies.

In capitalist economies the use of money and legally binding money contracts to organize production and sales of goods and services permits individuals to have some control over their cash inflows and outflows and therefore some control of their monetary economic future. Purchase contracts provide household decision makers with some monetary cost control over major aspects of their cost of living today and for months and perhaps years to come. Sales contracts provide business firms with the legal promise of current and future cash inflows sufficient to meet the business firms’ costs of production and generate a profit.

People and business firms willingly enter into contracts because each party thinks it is in their best interest to fulfill the terms of the contractual agreement. If, because of some unforeseen event, either party to a contract finds itself unable or unwilling to meet its contractual commitments, then the judicial branch of the government will enforce the contract and require the defaulting party to either meet its contractual obligations or pay a sum of money sufficient to reimburse the other party for all monetary damages and losses incurred. Thus, as the biographer of Keynes, Lord Robert Skidelsky has noted, for Keynes “injustice is a matter of uncertainty, justice a matter of contractual predictability.”

In other words, by entering into contractual arrangements people assure themselves a measure of predictability in terms of their contractual cash inflows and outflows, even in a world of economic uncertainty.

In their book, Arrow and Hahn (1971, pp 256-7 emphasis added) wrote “The terms in which contracts are made matter. In particular, if money is the goods in terms of which contracts are made, then the prices of goods in terms of money are of special significance. This is not the case if we consider an economy without a past or future ... If a serious monetary theory comes to be written, the fact that contracts are made in terms of money will be of considerable importance.” Only Keynes’s liquidity theory explaining the operation of a capitalist economy provides this serious monetary theory as a way of coping with an uncertain future. And in so doing suggests that the primary function of a Central Bank – as the Monetary authority – is to prevent financial markets for liquid assets from failing.

Money is that thing that government decides will settle all legal contractual obligations. This definition of money is much wider than the definition of legal tender which is “This note is legal tender for all debts, private and public.”

An individual is said to be liquid if he/she can meet all contractual obligations as they come due. For business firms and households the maintenance of one’s liquid status is of prime importance if bankruptcy is to be avoided. In our world, bankruptcy is the economic equivalent of a walk to the gallows. Maintaining one’s liquidity permits a person or business firm to avoid the gallows of bankruptcy.

Since the future is uncertain, we never know when we might be suddenly faced with a payment obligation at a future date that we did not, and could not, anticipate, and which we could not meet out of the cash inflows expected at that future date. Or else we might suddenly find an expected cash inflow disappears for an unexpected reason. Accordingly, we have a precautionary liquidity motive for maintaining a positive bank balance plus further enhancing our liquidity position to cushion the blow of any unanticipated and possible unforeseeable events that may occur in the uncertain future.

If individuals suddenly believe the future is more uncertain than it was yesterday, then it will be only human to try to reduce cash outflow payments for goods and services today in order to increase our liquidity position to handle any uncertain adverse future events since our fear of the future has increased. The most obvious way of reducing cash

outflow is to spend less income on produced goods and services – that is to save more out of current income.

In a Keynes analysis, on the other hand, the civil law of contracts and the importance of maintaining liquidity play crucial roles in understanding the operations of a capitalist economy – both from a domestic national standpoint and in the context of a globalized economy where each nation may employ a different currency and even different civil laws of contracts. I can not pursue, in this paper, the international aspect of money and contracts, but I do discuss it in my book (Davidson, 2007) and my forthcoming book (Davidson, 2009).

In Keynes's theory *the sanctity of money contracts is the essence of the entrepreneurial system we call capitalism*. Since money is that thing that can always discharge a contractual obligation under the civil law of contracts, money is the most liquid of all assets. Nevertheless other liquid assets exist that have some lower degree of liquidity than money since these other assets cannot be “tended” i.e., handed to the party, to discharge a contractual obligation. As long as these other assets can be readily resold for money (liquidated) in a well organized and orderly financial market, however, they will possess a degree of liquidity. A rapid sale of the liquid asset for money will permit people to use the money received from the sale of financial assets to meet their contractual obligations.

By an orderly financial market we means that the price on the next sale of a financial asset transaction to be executed will not differ by very much from the price of the previous transaction. As Peter L. Bernstein, author of the bestseller *Against The Gods*, has noted the existence of orderly financial markets for liquid assets encourage each holder (investor) of these securities to believe they can execute a fast exit strategy at any moment when they suddenly decide they are dissatisfied with the way things are happening Without liquidity for these stocks, the risks of being a minority stock holder (owner) in a business enterprise would be intolerable. Nevertheless the liquidity of orderly equity markets and it's promotion of fast exit strategies makes the separation of ownership and control (management) of business enterprises an important economic problem that economists and politicians have puzzled over since the 1930s. In fact, Greenspan's surprise that the managers of large investment bankers were not protecting the interests of the owners of these corporations indicates he does not understand the difference liquid markets make in driving a wedge between ownership and control. In classical theory there can never be a separation in the decision making between owners and managers.

In my paper “Securitization, liquidity and market failure” (Davidson, 2008b), I explain why, as long as the future is uncertain and not just probabilistically risky, the price that liquid assets can sell for at any future date in a free market could vary dramatically and almost instantaneously. In the worse case scenario liquid financial assets could become unsaleable (illiquid) at any price as the market collapses (fails) in a disorderly manner creating toxic assets. This is what happened in the mortgage backed securities (MBS) markets which precipitated the current international financial crisis.

To assure holders of liquid securities that the market price for their holdings will always change in an orderly manner, there must exist a person or firm in the market called a “market maker”. The existence of this market maker assures the public that if, at any time, most holders of the financial asset suddenly want to execute a fast exit strategy and sell, while few or no people want to buy this liquid asset, the market maker has the obligation to enter the market and purchase a sufficient volume of the asset being offered for sale to assure that the new market price of the asset will change continuously in an “orderly” manner from the price of the last transaction. In essence the market maker assures the holders of a liquid asset that they can always execute a fast exit strategy at a price not much different than the last price. In the New York Stock Exchange these market makers are called “specialists.”

Orderliness is a necessary condition to convince holders of the traded asset that they can readily liquidate their position at a market price close to the last publically announced price. In other words, orderliness is necessary to maintain liquidity in these markets. Orderliness provides preventive medicine against toxic assets.

In other words, in a world where the future is uncertainty and not just probabilistically risky, for an orderly liquid resale market to exist, there must be a “market maker”_who assures the public that he/she will swim against any rip-tide of sell orders. The market maker must therefore be very wealthy, or at least have access to significant quantities of cash if needed. Nevertheless, any private market maker could exhaust his/her cash reserve in fighting against a cascade of sell orders from holders. Liquidity can be guaranteed under the most harshest of market conditions only if the market maker has easy direct or indirect access to the Central Bank to obtain all the funds necessary to maintain financial market orderliness. Only market makers having such preferred access to the Central Bank can be reasonably certain they always can obtain enough cash to stem any potential disastrous financial market collapse. Consequently, the primary function of central banks is to promote orderliness in public financial markets by providing as much liquidity as these markets need. If the central bank is on its toes, it will provide such liquidity before a financial crisis can develop!

An interesting illustration of this occurred on the days following the terrorist attacks on the World Trade Center and the Pentagon on September 11, 2001. As the World Trade Center buildings collapsed there was a great fear that the public’s confidence in New York financial markets and the U.S. government would also collapse. To maintain confidence in the government bond market, in the two days following the attack the Federal Reserve pumped \$45 billion into the banking system. Simultaneously, since the primary bond dealers in New York tend to “make” the government bond market, “to ease cash concerns among primary dealers in bonds — which include investment banks that aren’t able to borrow money directly from the Fed — the Fed on Thursday [September 13, 2001] snapped up all the government securities offered by dealers, \$70.2 billion worth. On Friday it poured even more into the system, buying a record \$81.25 billion of government securities” (Raghaven, Pulliman and Opdyke, 2001, p. A1). In effect, these actions of the Federal Reserve, in exchange for money, removed liquid government bonds from any member of the public who worried about the future after the terrorist

attacks. In the days after September 11, the Federal Reserve provided whatever amount of liquidity the public wanted by making liquidity available to financial intermediaries who make the government bond market. Any member of the general public who wanted to could make a fast exit.

Furthermore, *The Wall Street Journal* reported that just before the New York Stock Exchange reopened on September 17 for the first time since the terrorist attack, investment banker Goldman Sachs, loaded with liquidity due to Fed activities, phoned the chief investment officer of a large mutual fund group to tell him that Goldman was willing to buy any stocks the mutual fund managers wanted to sell. *The Journal* notes that, at the same time, corporations “also jumped in, taking advantage of regulators’ newly relaxed stock buyback rules” (Raghaven, Pulliman, and Opdyke, 2001, p. 1). These corporations bought back securities that the general public held, thereby making the market by propping up the price of their securities.

In a more recent case, on March 13, 2008, the Federal Reserve worked out a deal via J.P. Morgan Chase to provide Bear Stearns with a loan against which Bear Stearns pledged as collateral its basically illiquid mortgage backed securities. This permitted Bear Stearns to avoid having to dump securities on an already set of failing markets in an attempt to obtain enough liquidity to meet Bear Stearns’s “repo” loans obligations due on March 14. Accordingly, Bear Stearns gained some breathing room and the selling pressure on financial markets were, at least temporarily, relieved. J. P. Morgan was the conduit for the loans to Bear Stearns because Morgan has access to the Federal Reserve’s discount window and it is supervised by the Federal Reserve. Nevertheless, it was obvious on March 13 that if Bear Stearns failed and the collateral was insufficient to cover the loan, the Federal Reserve and not J. P. Morgan would take the loss.

On the (Sunday) evening of March 16, the Federal Reserve and J. P. Morgan announced that J.P. Morgan would buy Bear Stearns for the fire sale price of \$2 per share. (Bear Stearns shares had closed at \$30 per share on Friday March 14.) The Federal Reserve also agreed to lend up to \$30 billion to J. P. Morgan to finance the illiquid assets it inherited from the purchase of Bear Stearns. In essence the Federal Reserve was acting almost like the Resolution Trust Corporation (RTC) that dealt with the illiquid assets of insolvent Savings and Loan banks in the 1989 Savings and Loan bank insolvency crisis³ by preventing J. P. Morgan from having to dump Bear Stearns assets on the market to obtain cash to meet the Bear Stearns obligations that J. P. Morgan inherited.

The post September 11, 2001 activities of the Federal Reserve flooding the banking system directly and other financial institutions indirectly with liquidity vividly demonstrate that the Central Bank can either directly or indirectly make the market for securities by reducing the outstanding supply of securities available for sale to the general public. The public could then satisfy its increased bearishness tendencies by increasing its money holdings without depressing the market price for financial assets in a disorderly manner. Until, and unless, the public’s increase in bearishness recedes, the Central Bank and the market makers can hold that portion of the outstanding liquid assets that the public does not want to own.

In sum, although the existence of a market maker provides, all other things being equal, a higher degree of liquidity for the traded assets, this assurance could dry up in severe sell conditions unless the Central Bank is willing to take direct action to provide resources to the market maker or, even indirectly to the market. If the market maker runs down his/her own resources and is not backed by the Central Bank indirectly, the asset becomes temporarily illiquid. Nevertheless, the asset holder “knows” that the market maker is providing his/her best effort to search to bolster the buyers’ side and thereby restore liquidity to the market.

In action to support financial markets, a Central Bank abandons the function that classical theory rationalizes, i.e., to set the inflation rate and instead accepts the Keynes function of being the market maker of last resort.

Modern financial efficient market theory suggests that these quaint institutional arrangements for market maker specialists to create orderliness are antiquated in this computer age. With the computer and the internet, it is implied that the meeting of huge numbers of buyers and sellers can be done rapidly and efficiently in virtual space. Consequently there is no need for humans to act as specialists who keep the books and also make the market when necessary to assure the public the market is well organized and orderly. The computer can keep the book on buy and sell orders, matching them in an orderly manner, more rapidly and more cheaply than the humans who had done these things in the past.

In the many financial markets that failed in the Winter of 2007-2008 (e.g., the markets for mortgage backed assets, auction rate securities, et cetera), the underlying financial instruments that were to provide the future cash flow for investors typically were long term debt instruments. A necessary condition for these markets to be efficient is that the probabilistic risk of the debtors to fail to meet all future cash flow contractual debt obligations can be ‘known’ with actuarial certainty. With this actuarial knowledge, it can be profitable for insurance companies such as AIG to provide holders of these financial assets with insurance guaranteeing solvency and the payment of interest and principal liabilities by the debtors.

In the classical efficient market theory, any observed market price variation around the actuarial value (price) determined by fundamentals is presumed to be statistical “white noise.” Any statistician will tell you, if the size of the sample increases, then the variance (i.e., the quantitative measure of the white noise) decreases. Since computers can bring together many more buyers and sellers globally than the antiquated pre computer market arrangements, the size of the sample of trading participants in the computer age will rise dramatically. If, therefore, you believe in efficient market theory, then permitting computers to organize the market will decrease significantly the variance and therefore increase the probability of a more well organized and orderly market than existed in the pre-computer era.

In a world of efficient financial markets, holders of market traded assets can readily liquidate their position at a price close to the previously announced market price whenever any holder wishes to reduce his/her position in that asset. If the efficient market

theory is applicable to our world, then how can we explain so many securitized financial markets failing in the sense that investors are finding themselves locked into investments they can't cash out of?

Keynes's Liquidity theory can provide the explanation. Keynes presumes that the economic future is uncertain. If future outcomes cannot be reliably predicted on the basis of existing past and present data, then there is no actuarial basis for insurance companies to provide holders of these assets protection against unfavorable outcomes. Accordingly, it should not be surprising that insurance companies such as AIG that have written policies to protect asset holders against possible unfavorable outcomes resulting from assets traded in these failing securitized markets find they have experienced billions of dollars more in losses than the companies had previously estimated (Morgenson, 2008). In a nonergodic world, it is impossible to actuarially estimate insurance payouts in the future.

Although the existence of a market maker provides, all other things being equal, a higher degree of liquidity for the traded assets, this assurance could dry up in severe sell conditions unless the Monetary Authority is willing to take direct action to provide resources to the market maker or, even indirectly to the market. If the market maker runs down his/her own resources and is not backed by the Monetary Authority indirectly, the asset becomes temporarily illiquid. Nevertheless, the asset holder "knows" that the market maker is providing his/her best effort to search to bolster the buyers' side and thereby restore liquidity to the market.

In markets without a market maker, on the other hand, there can be no assurance that the apparent liquidity of an assets can not disappear almost instantaneously. Moreover, in the absence of a market maker, there is nothing to inspire confidence that someone is working to try to restore liquidity to the market.

Policy Implications

The policy response to the financial market failings we are experiencing can be broken into two parts. First, what can be done to prevent future reoccurrences of this widespread failure of public financial markets? Secondly, what, if anything can be done today to limit any depressing effects of the current credit crunch developing in these securitized financial markets depends on Central Bank actions to make sure there is a market maker for all assets traded in a public financial market.

The question of prevention is the easier of the two to answer and implement. According to the web page of the United States Securities and Exchange Commission (www.sec.gov): "The mission of the U.S. Securities and Exchange Commission is to protect investors, maintain fair, orderly, and efficient markets, and facilitate capital formation." The SEC Web page then goes on to note that the Securities act of 1933 had two basic objectives: "require that investors receive financial and other significant information concerning securities being offered for public sales, and prohibit deceit, misrepresentations, and other frauds in the sale of securities"

The SEC regulations apply to public financial markets where the buyer and the seller of an asset do not ordinarily identify themselves to each other. In a public financial market each buyer purchases from the impersonal marketplace and each seller sells to the impersonal market. It is the responsibility of the SEC to assure investors that these public markets are orderly.

In contrast, a private financial market would be where both the buyer and the seller of the any financial asset are identified to, and know, each other. For example, bank loans were typically a private market transaction that would not come under the purview of the SEC. In the past, there were no resale markets for bank loan securities created in private financial markets. The loan debt contract resulting from a transaction in a private market traditionally has been an illiquid asset that the lender “knew” he/she would have to keep on the asset side of his/her balance sheet until the loan was paid off or the borrower went into default. Under such conditions, the lender knew enough to carefully check the borrower for the three C’s – Collateral, Credit History, and Character – before granting a loan.

On its web page, The Securities and Exchange Commission also declares that: “As more and more first-time investors turn to the markets to help secure their futures, pay for homes, and send children to college, our investor protection mission is more compelling than ever”. Given the current experience of contagious failed and failing public financial markets, it would appear that the SEC has been lax in pursuing its stated mission of investor protection. Accordingly the United States Congress should require the SEC to enforce diligently the following rules:

1. Public notice of potential illiquidity for public markets that do not have a credible market maker. In the last quarter of a century, large financial underwriters have created public markets , which, via securitization, appeared to convert long term debt instruments (some of them very illiquid, e.g., mortgages) into the virtual equivalent of high yield, very liquid money market funds and other short term deposit accounts. As the newspaper reports that we have cited indicate, given the celebrated status of the investment bank-underwriters of these securities and the statements of their representatives to clients, individual investors were led to believe that they could liquidate their position at a orderly change in price from the publically announced clearing price of the last public auction.

This perceived high degree of liquidity for these assets has now proven to be illusionary. Purchasers might have recognized the potential low degree of liquidity associated with these assets if the buyers were informed of all the small print regarding market organization. In markets such as the auction rate security markets, for example, although the organizer-underwriter could buy for their own account, they were not obligated to maintain an orderly market. Since the mandate of the SEC is to assure orderly public financial markets, and “require that investors receive financial and other significant information concerning securities being offered for public sales, and prohibit deceit , misrepresentations, .. in the sale of securities”, it is would seem obvious that all public financial markets that

are organized without the existence of a credible market maker should, either (1) be shut down because of the potential for disorderliness, or (2) at a minimum, information regarding the potential illiquidity of such assets should be widely advertised and made part of essential information that must be given to each purchaser of the asset being traded.

The draconian action suggested in (1) above is likely to meet with severe political resistance, as the financial community will argue that in a global economy with the ease of electronic transfer of funds, a prohibition of this sort would merely encourage investors looking for higher yields to deal with foreign financial markets and underwriters to the detriment of domestic financial institutions and domestic industries trying to obtain capital funding.

Elsewhere, I have proposed (Davidson (2007)) an innovative international payments system,⁴ that could prevent US residents from trading in foreign financial markets that the U.S. deemed detrimental to American firms that obeyed SEC rules while foreign firms did not follow SEC rules. If, however, we assume that the current global payments system remains in effect, and there is a fear of loss of jobs and profits for American firms in the FIRE industries, then the SEC could permit the existence of public financial markets without a credible market maker as long as the SEC required the organizers of such markets to clearly advertise the possible loss of liquidity that can occur to holders of assets traded in these markets.

A civilized society does not believe in “caveat emptor” for markets where products are sold that can have terribly adverse health effects on the purchaser. Despite the widespread public information that smoking is a tremendous health hazard, government regulations still require cigarette companies to print in bold letters on each package of cigarettes the caution warning that “Smoking can be injurious to your health.” In a similar manner, any purchases on an organized public financial market that does not have a credible market maker can have serious financial health effects on the purchasers. Accordingly, the SEC should require the following warning to potential purchasers of assets traded in a market without a credible market maker: “This market is not organized by a SEC certified credible market maker. Consequently it may not be possible to sustain the liquidity of the assets being traded. Holders must recognize that they may find that their position in these markets can be frozen and they may be unable to liquidate their holdings for cash.”

2. Prohibition against securitization that attempts to create a public market for assets that originated in private markets - The SEC should prohibit any attempt to create a securitized market for any financial instrument or a derivative backed by financial instruments that originates in a private financial market (e.g., mortgages, commercial bank loans, etc).

3 Congress should legislate a 21 century version of the Glass Steagall Act. The

purpose of such an act should force financial institutions to be either an ordinary bank lender creating loans for individual customers in a private financial market, or an underwriter broker who can only deal with instruments created and resold in a public financial market.

What can be done to mitigate the depressing consequences of the current financial mess? In two earlier papers (Davidson, 2008a, 2008b), I proposed (1) the creation of a 21st century equivalents of the Roosevelt era Home Owners Loan Association (HOLC), and the Bush I Administration's Resolution Trust Company (RTC) to alleviate the United States housing bubble crisis and to prevent potential massive insolvency problems by removing toxic assets from financial institution balance sheets while penalizing managers and stockholders of these financial institutions. The central bank and/or the Government must act positively and strongly to remove these assets from good bank balance sheets. The difficult political problem is what price should be paid to holders of these toxic assets to remove them from their balance sheets. But that is a story for another paper.

NOTES

1. Especially Nobel Prizes in economics.
2. A religious person who accepts as a fundamental truth the Bible's story of creation where a Divine Being created humans and all the animals in six days must reject any "scientific" evolutionary evidence that purports to demonstrate that humans evolved from lower life forms over thousands of years. Similarly, a true believer in the axiomatic foundations of classical theory will deny that money can be shown to be ultimately non-neutral in the long-run. This is not to deny that some members of the "New Keynesian" school and even some Old Classical school Monetarists accept the notion that money may be nonneutral in the short-run, because of some "temporary" supply-side failure of the free market. Nevertheless all mainstream economists believe in the long-run money is neutral.
3. The need for a revived Resolution Trust Company to help solve the financial market crisis that was initiated with the sub prime mortgage problem was emphasized in my earlier paper on "How to Solve the U.S. Housing Mess And Avoid A Recession: A Revised HOLC and RTC," Policy Note, Schwartz Center For Economic Policy Analysis, The New School, January 2008.
4. My proposed international payments system is a variant of the Keynes Plan that was presented by Keynes at the Bretton Woods conference in 1944 and rejected by the United States.

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