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THE END OF ALCHEMY: A REVIEW ESSAY

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The End of Alchemy by Mervyn King: A Review Essay*

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Abstract

I review *The End of Alchemy* by Mervyn King, published by W.W. Norton and Company in 2016. I discuss King's proposed regulatory reform, the 'Pawn Broker for All Seasons' (PFAS) and I compare it to an alternative solution developed in my own work. I argue that unregulated trade in the financial markets will not, in general, lead to Pareto optimal allocations. As a consequence, solutions like the PFAS that correct problems with existing institutions are likely to be circumvented by the development of new ones.

1 Introduction

Mervyn King is one of an elite group of academic economists who has experienced policy making first hand. He began his education in economics at Cambridge England, studying with Richard Kahn and Joan Robinson and completed his education at Cambridge Massachusetts as a Kennedy Scholar at Harvard University. Beginning life as the son of a railway porter in Buckinghamshire, England, Mervyn King enjoyed a distinguished academic career, notably as the founder of the Financial Markets Group at the London School of Economics. In 1993, he moved to the Bank of England, first as Chief Economist, then as Deputy Governor and, beginning in 2003, as Governor.[1]

Ennobled in 2013, Mervyn Allister King, Baron King of Lothbury, is worth reading when he writes a book with the subtitle: *Money, Banking, and the Future of the Global Economy*: He is one of the few people on this planet who helped steer the global economy through the worst financial crisis since the Great Depression.

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[1] Wikipedia (2015).

Policy makers who leave their posts write two types of books. There are those who write kiss and tell books that reveal personal details of the policy maker's interactions with world leaders. *The Economic Consequences of the Peace*, the book that brought John Maynard Keynes to prominence in the public eye, was a book of this kind.[2] *The End of Alchemy* is not one of these. It is a substantive analysis of the 2008 financial crisis, seen through the lens of an academic who lived through and participated in managing that crisis as Governor of the Bank of England. That, in itself, makes it essential reading for all who seek to further their understanding of the Great Recession.

2 What the Book Seeks to Achieve

The End of Alchemy is aimed at the general reader and, for the most part, it succeeds at introducing relatively technical economic concepts in an understandable way. In the introduction, King discusses four concepts that will knit together his narrative; *disequilibrium*, *radical uncertainty*, *prisoner's dilemma* and *trust*.

By *disequilibrium*, King means that the global economic order has been characterized, for the past thirty years, by trade imbalances in which some countries have run persistent balance of payments deficits and others have run surpluses. He *does not mean* that the quantity of labor demanded is unequal to the quantity supplied at existing market wages and prices. This is but one of many instances where King has opted to use language that will be understood by a layperson but that may sow confusion in the mind of the inattentive economist.

By *radical uncertainty,* he is referring to Frank Knight's distinction between risk, in which the future is modeled as the unfolding of a known probability measure, and [*radical*] uncertainty in which the future is both unknown and unknowable.[3] This is close to the view of uncertainty favored by Keynes which formed the basis for his famous passage on 'animal spirits'.[4] In Mervyn King's view, Knight's version of an uncertain future is a critical piece of any explanation of macroeconomic events.

King uses *prisoner's dilemma* as a catch-all phrase that refers to an outcome that is individually rational but not socially optimal. That will be a non standard usage for many economists who might see the prisoner's dilemma as one instance of a non Pareto Optimal equilibrium. It is nevertheless, a relatively effective way of communicating an idea to a general audience. Many of King's readers will be familiar with the prisoner's dilemma. They may be less familiar with what economists mean by an equilibrium or a Pareto Optimum.

[2] Keynes (1920).

[3] Knight (1921).

[4] Keynes articulated his theory in the *Treatise on Probability,* (Keynes, 1921) a book that was long in gestation and that was not well received by contemporary statisticians. For a discussion of the receipt of the *Treatise* by his contemporaries see Skidelsky (1983, pp 222-223). The term 'animal spirits' appears in *The General Theory* (Keynes, 1936, Ch. 12 par. VII).

Finally, there is the concept of *trust* which is used in a standard way to mean that we all make choices based on beliefs about the way others will act in the future. The principal way in which trust enters the narrative is when King describes theories of money in Chapter 2.

Chapters 1 through 9 consist of an interwoven set of three themes. First, there is a description of economic history and the evolution of institutions. Here, I include King's interpretation of the 2008 financial crisis and how he perceives his own role in the way that crisis was handled. Second, there are a number of passages that describe economic theories of money, banking and macroeconomics to the general reader. Third, there is Mervyn King's prescription for what needs to be done to prevent the next financial crisis which he sees as inevitable. I found King's views on future policy to be the most interesting of these three themes.

3 The Crisis Narrative

What went wrong with the world financial system in 2008? No book about the future of the global economy would be complete without an answer to that question. Mervyn King's explanation is a relatively conventional account of events that preceded the collapse of the UK building society, Northern Rock, in September of 2007 and the subsequent failure of Lehman Brothers a year later in the United States.

According to King, the story begins with a global savings imbalance that is connected with the growth of China. Traditionally, Chinese peasants relied on the family to provide for their security in old age. The one-child policy, introduced in 1979, meant that Chinese workers could no longer rely on their children and grandchildren for support and, in the absence of adequate state pensions, those workers began to save heavily. Chinese private savings rates increased from 6-7% GDP in 1978 to an average that hovered between 34 and 53% over the past thirty years.[5] Coupled with real annual Chinese growth above 8% for almost three decades, U.S. markets experienced an inflow of capital that depressed long-term real interest rates. In King's narrative, that capital flowed through U.S. financial institutions and contributed to a big increase in the size of bank balance sheets.

As ever larger flows of savings moved through the banking system, two factors caused a fragility in the equilibrium between borrowers and lenders that would eventually lead to collapse. The first was deregulation of financial markets, fueled by free-market economic ideas that emanated from the University of Chicago. The second was the reach for yield; the idea that in the presence of falling long-term real interest rates, it became necessary to take ever increasing risks to earn the same return.

In the United States, the 1930's Glass-Steagall Act that had separated commercial and investment banking was repealed in 1999 with the passage of the Gramm-Leach-Bliley Act. The repeal of Glass-Steagall was followed by an explosion of new financial instruments as non-bank financial intermediaries sought

[5] Yang et al. (2011, pp. 5-6).

to emulate the maturity transformations that were traditionally the preserve of banks. It also led to commercial banks extending their lending activities to ever riskier loans using funds that were subject to government guarantees. In the King narrative, this was an example of disequilibrium that was not going to end well.

Given that the inevitability of an eventual crisis was obvious to many economists and policy makers, including Mervyn King himself, King asks three questions.[6] Why didn't we see it coming? Why haven't we done more to fix it? And, why is the world still suffering from low growth, inflated central bank balance sheets and historically low real rates? The rest of the book lays out King's answers to these questions.

The answer to the first question comes in Chapter 8 where King presents a counterfactual analysis, approvingly quoting his predecessor, Eddie George, who was Governor of the Bank of England from 1993 through 2003,

> So in effect we have taken the view that unbalanced growth in our present situation is better than no growth, (King, 2016, pp. 330)

And in King's own words

> Should policy have erred on the side of slower growth and undershooting of the inflation target in order to reduce the risk of a destabilising correction later? The alternative policy would have been to keep interest rates higher in the hope that a slowing of domestic demand would change the narrative driving spending decisions. Asset prices, debt and bank leverage might have risen by somewhat less. Any such alternative path for the economy would have implied recession and unemployment, as well as inflation below the target. (King, 2016, pp. 330).

In other words, the Bank of England's Monetary Policy Committee (MPC) made the conscious choice, in the words of previous Fed Chairman William McChesney Martin, not to "order the punch bowl removed just when the party was warming up".[7]

I will turn to King's answers to the other two questions in the following sections.

4 The Role of Radical Uncertainty

I spent a year at the Bank of England in 2013 as Senior Houblon Norman Fellow and, at that time, I had the chance to ask then Governor King about his views in person. After a brief discussion of my own work, I committed the venial sin of suggesting that the Bank of England had become a bastion of New Keynesian

[6] King (2016, pp. 39).

[7] This often cited quote comes from a speech deliverd by McChesney Martin to a group of New York Investment Bankers in 1955 (Martin, 1955, pp. 12).

economists. Although the research department at the Bank is well stocked with recent Ph.D.s who are versed in the mechanics of Dynamic Stochastic General Equilibrium (DSGE) models, it was made very clear to me that this is not the thinking that guided Governor King's decisions. So what did guide those decisions?

In his magisterial summary of business cycle theory, Gottfried Haberler divided business cycle theories into two kinds: monetary and real theories of the cycle.[8] King comes down firmly on the monetary side. In his view, money is a partial solution to the problem of coping with radical uncertainty. The insistence of the importance of radical uncertainty can be traced to King's teachers at Cambridge, Joan Robinson and Richard Kahn, neither of whom was a fan of the intellectual development of the macroeconomics that passed for 'Keynesianism' in Cambridge Massachusetts in the 1950's and that Robinson famously referred to as 'bastard Keynesianism'.[9] The branch of economic thought that lays stress on radical uncertainty survived in the literature on Post-Keynesian economics, and it is refreshing to see that that branch of Keynesian thought was also an important influence on the making of UK monetary policy under King's governorship.

Unsurprisingly, given his intellectual background, King is not a fan of the modern developments of Keynesian economics that incorporate rational expectations. He rejects the rational expectations assumption on the grounds that rational expectations theories assume an incredible degree of common knowledge. To use Knight's distinction, rational expectations is a theory of risk as opposed to uncertainty.[10] In reality, the future is both unknown and unknowable and a theory which asserts that human beings make rational decisions based on the known probability distribution of future events is bound to lead us astray.

> Under radical uncertainty, investors make judgements, perhaps based on a coping strategy, and with the benefit of hindsight these are sometimes described as 'mistakes'. But beliefs change, and who is to know which beliefs are correct? (King, 2016, pp. 154).

Who can disagree with that? But if expectations are not rational, how should we model decision making under uncertainty? One popular recent approach is based on behavioral economics. This is a set of theories that reject narrow concepts of rational behavior. The award of the Nobel Prize in 2002 to Daniel Kahneman and Amos Tversky for their work on Prospect Theory was a huge impetus to behavioral economics and it has been widely translated to the popular imagination with the publication of the best selling books *Nudge*, by Cass Sunstein and Richard Thaler and *Animal Spirits*, by George Akerlof and Robert Shiller.[11] According to the behavioral critique of neoclassical theory, human beings do not maximize expected utility: they are more complex

[8] Haberler (1937).
[9] Robinson (1978, pp. 256).
[10] Knight (1921).
[11] Kahneman and Tversky (1979), Sunstein and Thaler (2009), Akerlof and Shiller (2009).

creatures who suffer from regret, confirmation bias, and loss aversion. Perhaps more surprisingly, King is also dismissive of this approach. In a passage that I agree with strongly, he asserts that,

> The danger in the assumption of behavioural economics that people are intrinsically irrational is that it leads to the view that governments should intervene to correct 'biases' in individual decisions or to 'nudge' them towards optimal outcomes. But why do we feel able to classify behaviour as irrational? Are policy-makers more rational than the voters whose behaviour they wish to modify? (King, 2016, pp. 133)

King is clearly not a fan of Thaler and Sunstein's arguments in *Nudge* or Akerlof and Shiller's calls in *Animal Spirits* for public policies to correct irrational private mistakes. If human beings, acting albeit on incomplete information, make mistakes; who will set them straight? Perhaps it is a committee of experts chosen by politicians for their knowledge and wisdom? Or perhaps, as in previous centuries, it is the church? King rejects this view, rightly in my opinion, on the grounds that it leads down a dangerous path to paternalism.[12] Individuals are not irrational, they are simply acting on incomplete knowledge, a situation that is shared by policy-makers in national treasuries and central banks. In King's words,

> The problem with behavioural economics is that it does not confront the deep question of what it means to be rational when the assumptions of the traditional optimising model fail to hold. Individuals are not compelled to be driven by impulses, but nor are they living in a world for which there is a single optimising solution to each problem. If we do not know how the world works, there is no unique right answer, only a problem of coping with the unknown. A different way of thinking about behaviour as neither irrational nor the product of a constrained optimisation problem is, I believe, helpful in understanding what happened both before and after the crisis. In other words, we need an alternative to both optimising behaviour and behavioural economics. (King, 2016, pp. 154).

King's replacement for rational expectations is a *coping strategy*. This has three elements. First the decision maker needs a *categorization* to classify problems into those that can be solved through optimization and those that cannot. Second, to make a decision that is not amenable to optimization, the decision maker needs a set of *rules of thumb*. And finally, the decision maker needs a *narrative*, that is,

> a story that integrates the most important pieces of information in order to provide a basis for choosing the heuristic and the motives for a decision. (King, 2016, pp. 136).

[12] See my review of Akerlof and Shiller's book, *Animal Spirits,* where I make the same point (Farmer, 2009, pp. 357).

Although King rightly dismisses the paternalistic arguments of behavioural economists, his description of a coping strategy does not seem far removed from the notion of stories as epidemics that Robert Shiller expounded in his 2017 Presidential address to the American Economics Association.[13] Many behavioral economists would, I believe, be willing to embrace King as one of their own.

5 The Role of Money in a World of Radical Uncertainty

The rational expectations approach to macroeconomics that dominated the views of academics for the past forty years assumes that economic actors are able to trade a complete set of securities, indexed to every conceivable future event. Mervyn King dismisses this conception as an unrealistic fairy tale. It is infeasible to write contracts contingent on events that we cannot anticipate. Nevertheless, many of us form beliefs about possible futures and, when our beliefs are in conflict, we take bets on those views by trading in financial markets.

Interestingly, King argues that the existence of more complex financial markets may amplify, rather than dampen, fluctuations. Suppose that I hold the firm belief that the stock market will increase by 50% next year. You hold the equally firm belief that it will crash. There is clearly room for us to trade with each other based on our convictions. And since you and I both believe that we are playing the other for a fool, we both feel wealthier once we have traded contracts. Acting on our perception of increased future wealth, we may both decide to spend more today and, by acting on that belief, create a boom. But because we cannot both be right, that boom will carry the seeds of its own collapse.

King sees money as a way of dealing with the shifting narratives of human behavior. In the absence of a complete set of futures markets, individual traders turn to the market makers who

> ...offer the opportunity to transact immediately once a decision to buy or sell has been taken. Many financial centres boast that their markets are 'deep and liquid'. By that they mean that investors can quickly sell their financial assets, with only a very small reduction, if any, in their prices, in order to obtain money. (King, 2016, pp. 149).

But, according to Mervyn King, liquidity is an illusion.

> ... in a capitalist economy, money, banking and financial markets are institutions that have evolved to provide a way of coping with an unpredictable future. They are the real-world substitute for the economic theorist's concept of a grand auction.

[13] Shiller (2017).

> ... Money gives us the ability to exchange labour today for generalized purchasing power in the future. ... [it] is not just a means of buying 'stuff' but a way of dealing with an uncertain future. (King, 2016, pp. 155).

The illusion, for King, is that the value that has been created from trust can disappear overnight when that trust evaporates. This conception of the importance of radical uncertainty informs King's view of financial markets.

In my own research I have shown that there is information in the financial markets that helps predict the future value of the unemployment rate.[14] Using a term coined by Clive Granger, a statistician would say the stock market *Granger causes* the unemployment rate.[15] Granger causality is necessary, but not sufficient, to establish a causal chain from one event that precedes another. Does the stock market cause unemployment because asset prices are driven by rational beliefs of future fundamentals? I will call this the fundamental view of the stock market. Or are asset prices driven by shifting narratives that cause changes in future economic activity; I will call this the 'animal spirits view'. In my book *Prosperity for All*, I provide two analogies with everyday situations to explain the distinction between these views.[16]

According to the fundamental view of the stock market, asset prices are like a weather forecast. If a weather forecaster on the evening news tells you that it will rain tomorrow, you would be well advised to carry an umbrella in the morning. A government agency would be foolish if they tried to manipulate the weather by interfering with the weather forecast.

The animal spirits view of the market is closer to a different situation that I am all too familiar with from my perspective in Southern California. If a smoker drops a lighted cigarette in a tinder dry forest the outcome will be a devastating forest fire. The event of dropping the cigarette precedes the forest fire and here, it is a truly causal event. By preventing people from smoking in forests, government intervention can help to prevent forest fires.

My own view is that the stock market is like the forest fire. As a consequence of shifting narratives of the future, individual traders revalue assets and a big revaluation may cause liquidity to disappear overnight. The disappearance of liquidity and the accompanying fall in wealth, can *cause* a subsequent recession. King also comes down on the animal spirits side of this debate and he argues that

> ...stock prices move around because investors are trying to cope with an unknowable future. Their judgements about future profits can be highly unstable. This instability is fundamental to a capitalist economy. (King, 2016, pp. 132).

When investors lose confidence in the ability of assets to retain value, the illusion of liquidity may disappear overnight. That leads to a central question of

[14] Farmer (2012b, 2015).
[15] Granger (1969, 1980).
[16] Farmer (2016, pp. 103-104).

the book.[17] How can we design institutions that manage radical uncertainty in a way that prevents the human misery that accompanies events like the Great Depression of the 1930s, the Great Stagflation of the 1970s and, most recently, the Great Recession of 2008 and its aftermath?

6 What Commercial Banks Do

According to a popular narrative that Mervyn King subscribes to, a financial crisis is connected to the role of banks as institutions that convert long term illiquid investments into short term liquid funds that are available on demand. In economic jargon, commercial banks engage in a maturity transformation. It is this transformation that informs the title of King's book. Like alchemists who sought to transform base metals into gold, banks transform houses, factories and machines with unknown or questionable value into short term purchasing power, acceptable to all as a means of exchange.

If you choose to invest your wealth in the stock market by purchasing shares in, for example, Exon Mobil, your shares may or may not have value in the future. That depends on the vagaries of the oil market. It also depends on what other people think of the future opportunities for Exon Mobil to make a profit. A portfolio of risky long term investments may be a good way of accumulating wealth for your retirement. It is a very bad way of holding your wealth if you are likely to need money in the near future. If you walk into a car showroom and try to purchase a new Honda Accord by offering shares in Exon Mobil in exchange, you are unlikely to meet with success. Claims to long-term risky income streams are not efficient ways of negotiating everyday purchases because their value is uncertain.

Banks, savings and loan institutions and their UK counterparts, building societies, turn houses, factories and machines into paper money by borrowing short-term funds and lending those funds long-term. The liability side of a bank balance sheet consists of highly liquid checking or deposit accounts that can be used for transaction purposes. The asset side consists of a small reserve of cash and a large quantity of illiquid loans to companies and households that are typically collateralized by mortgages or liens on other forms of property. By drawing checks or making electronic transactions that transfer ownership of bank liabilities, the bank has effectively turned assets that are, to the customer, of unknown quality, into money. But how does the bank know that the assets it owns are sound?

Traditionally, UK building societies built relationships with their customers and lent money only to those people that they trusted to repay. The average middle class or working class person in Newcastle on Tyne could visit their local branch of Abbey National and, once the branch manager had verified their

[17] Although the animal spirits narrative will sound plausible to those who earn their living by trading in the financial markets, it may surprise the reader to learn that it is inconsistent with the economics we have been teaching in our colleges and universities for the past 35 years. See Farmer (2016, Ch. 1) for a further discussion of this point.

ability to repay, the customer would be granted a loan to purchase a house. The house would act as security for the loan and, if the borrower were to make too many late payments, Abbey National would call in the loan and take possession of the house.

The money to lend to the borrowers came, in part, from ordinary people who deposited their pay checks into checking accounts. That money enters the commercial banking system in the form of reserves, originally in the form of gold and silver coins, and today, in the form of claims on the central bank. But the reserves held in checking or deposit accounts with the bank is never sufficient to cover the value of all outstanding loans to companies and homeowners.

Commercial banks also *create* money by lending to homeowners through the simultaneous creation of an asset, the loan to the homeowner, and a liability, an entry in the homeowner's account at the bank. In a competitive banking system, banks and other financial institutions compete for funds from depositors by paying interest on their accounts and, in a banking equilibrium, the mortgage interest coming in from loans is just sufficient to cover the operating costs of the bank and the interest paid on deposits, typically at a lower rate.

The creation of money by commercial banks is an efficient way of allowing the value of illiquid assets; the houses, factories and machines in an economy, from being traded quickly and efficiently at low cost. Bankers play the role of monitors who guarantee that the assets they hold have the value that their owners claim they have. This system is based on trust and, as long as that trust is maintained, it is a highly effective way of providing a means for anonymous trades to take place between people who may live in different regions, be of different backgrounds, and who may never meet more than once in their lives. But it is also highly fragile and, if the depositors in banks ever lose trust in the institutions that hold their assets, a modern financial system will collapse like a house of cards.

7 What Central Banks Do

In Chapter 5, "Heroes and Villains" King provides a relatively conventional account of the development of central banking over the past couple of decades.

In academic circles, there is a long-standing debate over rules versus discretion. On the rules side, there are those who argue that a central bank should announce a rule that it follow in all circumstances to meet its objective. John Taylor of the eponymous Taylor Rule is a big proponent of this approach.[18]

On the other side, there are those like Ben Bernanke and Mervyn King who argue that central bankers must adapt their responses to uncertain events and that no response will be the correct one in every circumstance.[19] King's position is, perhaps unsurprising, given his belief that the future is characterized by radical uncertainty as opposed to risk. He argues that central bankers, like members of the public, adopt 'coping strategies' to deal with this uncertainty.

[18] Taylor (1999).

[19] Bernanke (2015). King makes the same point in (King, 2016, Ch. 5).

Since these strategies must be adapted to changing circumstances, no fixed rule can ever be as effective as the discretionary actions of a smart banker.

King is similarly dismissive of the argument levied by a group of academic economists for so-called 'forward guidance'. The more extreme version of this argument is derived from the implications of a New-Keynesian macroeconomic model in which all decisions are made by a representative household with superhuman perceptions of future events. According to this view, a central bank should commit to a future path of interest rates and announce that path to the public. As King points out, the experiment with forward guidance by the Fed and later the Bank of England was short-lived because "the confidence that central banks wanted the private sector to have in their forecasts was not consistent with the inherent degree of uncertainty surrounding those forecasts".

So much for central banking in normal times. What of the correct response of the Central Bank in times of crisis? In recent decades, central banks have been charged with maintaining a stable value for the currency. But they have long played a second role. Walter Bagheot, a nineteenth century economist and former editor of the *Economist Magazine*, in his influential and highly recommended book *Lombard Street*, referred to this role as 'lender of last resort'.[20]

Capitalist economies are the most successful form of wealth creation yet devised and the institution of the market has pulled more human beings out of misery than any other known form of social organization. But the ride is not always a smooth one and eighteenth and nineteenth century capitalism in the UK was subject to a series of financial crises, not that dissimilar from the most recent Great Recession. Nineteenth century economists, notably Henry Thornton, recognized the role of credit as a contributing factor to the development of financial crises and they attributed a central role to the Bank of England in alleviating them.

Bagheot's analysis builds on Thornton's work and adds three original themes.[21] First, the Bank of England should make the public aware, in advance, that it would stand ready to lend in times of crisis. Second, lending should be offered at a penalty rate in order to force financial institutions to first exhaust all alternative sources of credit and third, Bagheot stipulated that the Bank should be willing to lend "on every kind of current security, or every sort on which money is ordinarily lent". He counseled that, in times of financial crisis, the Central Bank should lend freely since

> ... nothing can more surely aggravate the panic than to forbid the Bank of England to lend that money. Just when money is most scarce you happen to have an unusually large fund of this particular species of money, and you should lend it as fast as you can at such moments, for it is ready lending which cures panics, and non-lending or niggardly lending which aggravates them. (Bagheot, 1873, Ch.

[20] Bagheot (1873).

[21] Many of Bagheot's ideas were anticipated by Henry Thornton. *An Enquiry into the Nature and Effects of the Paper Credit of Great Britain* (Thornton, 1802). My comments in this paragraph draw on Humphrey (1975).

12, para. 13)

Bagheot was responding specifically to the experience of Great Britain during a major panic that occurred in 1825.

> The first panic of which it is necessary here to speak, is that of 1825: ... [in which] ... the Bank of England at first acted as unwisely as it was possible to act. By every means it tried to restrict its advances. The reserve being very small, it endeavoured to protect that reserve by lending as little as possible. The result was a period of frantic and almost inconceivable violence; scarcely any one knew whom to trust; credit was almost suspended; the country was, as Mr. Huskisson expressed it, within twenty-four hours of a state of barter. (Bagheot, 1873, Ch. 7, para. 62)

This is a familiar story which should encourage us all to acquaint ourselves with economic history. The 2008–9 crisis was not the first financial panic to hit a market economy, nor will it be the last. But, as Walter Bagheot and Mervyn King both emphasize, the financial world is evolving and we need new strategies to keep up with that evolution. Although Bagheot was no doubt influenced by earlier writers, he was dismissive of the ability to learn much from eighteenth century experience, most notably from crises that occurred in Great Britain in 1793 and 1797. The financial system had evolved in the interim.

> I hardly think we should derive much instruction from ... [the panics] ... of 1793 and 1797; the world has changed too much since; and during the long period of inconvertible currency from 1797 to 1819, the problems to be solved were altogether different from our present ones. (Bagheot, 1873, Ch. 7, par. 62).

King is similarly aware that, although there is much to be learned from our predecessors, the world has moved on:

> Although his [Bagheot's] description of a central bank's responsibility as a ''lender of last resort' has entered the textbooks, and was frequently cited as justification for their lending by central bankers during 2008–9, it is in need of updating. Banking has changed almost out of recognition since Bagheot's time. (King, 2016, pp. 94).

How has the world changed since Bagheot's time? Most notably, King informs us that, over the past century, the U.S. banking system has grown by a factor of five from 20 percent of annual GDP one hundred years ago to 100 percent of GDP today. And, in the UK, "the asset holdings of the top ten banks amount to over 450 percent of GDP, with Barclays and HSBC both having assets in excess of UK GDP." King attributes much of the growth in the financial sector, rightly in my view, to deregulation of the financial system which

> "...altered the business model and the culture of our biggest banks. ... Size became an objective because a bank that was clearly too important and too big to fail was able to borrow more cheaply, and even a small advantage in funding costs meant that it could offer cheaper loans to its customers. That enabled such a bank to expand more rapidly than its rivals in a virtuous circle of growth. (King, 2016, pp. 98).

If the world has moved on, so argues King, should our response to financial crises.

8 Financial Evolution and Financial Reform

To understand the background to King's case for regulatory reform, it will help if we take a diversion to put his arguments in the context of what previous writers on money and banking have said about the role of a central bank.

Traditionally, the assets of a commercial bank consist of reserves in the form of cash and government securities and liabilities in the form of checking and deposit accounts held by the public. During the 1990s, the system evolved and many institutions changed their business model. For example, the UK building society, Northern Rock, operated by borrowing short-term funds from the money markets and lending out those funds in the form of mortgages securitized by houses. In the run-up to the failure of Northern Rock in September of 2007, only 27% of its financing came from the retail funds of savers.[22] The rest was reliant on the ability of Northern Rock to borrow short-term funds from other financial institutions. When funds became scarce in the money markets, Northern Rock was unable to roll-over its short term debt and the result was a run on the bank by savers.

A solvent financial institution owns assets that have a value in excess of the value of its liabilities. The difference between the value of its assets and the value of its liabilities is, by definition, its equity capital. When the bank is in distress, the equity holders are the first line of defence against bank failure. In a trenchant analysis of the Great Recession and its aftermath, Anat Admati and Martin Hellwig have called persuasively for banks to be required to hold much larger buffers of equity capital.[23] When a bank fails, the failure not only affects the shareholders and depositors at the bank; it also has a systemic effect that arises from the nature of money as a social good. Because the failure of a commercial bank can spillover and cause welfare losses elsewhere in the economy, modern national governments offer guarantees to depositors in the event of failure.

Why should government intervene with burdensome regulations that require banks to hold excess capital? Surely the markets will efficiently allocate funds to competing ends. Not so. Because deposits are guaranteed in the event

[22] The Open University (2007).
[23] Admati and Hellwig (2014).

of failure, the managers of banks have an incentive to make riskier decisions than they otherwise might. If a bank makes bad investments, it may genuinely become insolvent.

A bank is insolvent if the value of its assets is less than the value of its liabilities. But because banks lend out long-term and borrow short-term, there is a thin line between insolvency and illiquidity. No bank could satisfy the demands of its creditors if all depositors were to attempt to withdraw their cash at the same time. During the nineteenth and early twentieth centuries, there were frequent examples of bank runs in which depositors lost trust in the ability of their banks. Institutions that would have been perfectly solvent, in the absence of a panic, nevertheless failed.

The solution to the problem of bank runs, embodied in the Glass-Steagall Act in the U.S. in the 1930s was to provide guarantees to depositors, backed up from tax-payer funds. And commercial banks that accepted guaranteed deposits were prevented from investing in anything other than safe government issued securities. Investment banks, in contrast, carried out risky maturity transformations by borrowing short and lending long, but it was understood that a loan to an investment bank would not be guaranteed in the event of failure. That system worked well for fifty years but, under a new philosophy of open capital markets, the division between commercial and investment banks was repealed with the passage of the Gramm-Leach-Bliley Act in 1999.

But although the repeal of Glass-Steagall is often cited as a contributing cause of the 2008 crisis, the nature of institutional change had already made 1930s regulations irrelevant. On Monday October 19th of 1987, the S&P fell by 20%. That fall is still, to this day, the largest one-day drop in stock market history. But it was not, as some predicted at the time, followed by a major recession.[24] The market did not crash because the then Chairman of the Federal Reserve, Alan Greenspan, had learned the lessons of history. Before the opening of the markets on Tuesday, October 20th, the Fed released the following statement

> The Federal Reserve, consistent with its responsibilities as the Nation's central bank, affirmed today its readiness to serve as a source of liquidity to support the economic and financial system. Quoted by Carlson (2006).

As Mark Carlson notes, in his discussion of the 1987 crisis[25] Greenspan testified to the Senate Banking Committee in 1994 that, during the 1987 panic, the Fed got on the phone to major New York banks and assured them that the Fed would back up its words with action. Contemporary newspaper articles reported similar information:

> Alerted by calls about the developing credit crisis from Mr. Phelan [Chairman of the NYSE] and others, the Fed leaned heavily

[24] New York Times (1987).
[25] Carlson (2006).

> on the big New York banks to meet Wall Street's soaring demand for credit. Mr. Corrigan and key aides personally telephoned top bankers to get the message across...The banks were told to keep an eye on the big picture—the global financial system on which all their business ultimately depends. A senior New York banker says the Fed's message was, 'We're here. Whatever you need, we'll give you.' (Stewart and Hertzberg, 1987).

It is significant that, during the 1987 crisis, the Glass-Steagall Act was still in effect. It was the investment banks that were bailed out, not mom-and-pop retail banks. The bail out of Wall Street, following the 1987 financial panic followed the Bagheot script. But it also sent a signal to the capital markets: the Fed has your back. That signal did not go unnoticed and it led to a further evolution of the financial services industry that culminated, in 2008, in the Great Recession.

9 A Pawnbroker for All Seasons

Bagheot's advice that the central bank should "lend as fast as it can" during a crisis was meant to alleviate the problem that commercial banks that borrow short and lend long are subject to runs. But commercial banks, aware that they will be bailed out in a crisis, have an incentive to make riskier loans than would otherwise be prudent. In the language of information economics, there is a 'moral hazard' problem. How should government deal with that problem?

During the 1920s, a number of prominent economists including Irving Fisher from Yale University, and Frank Knight, Henry Simons and Paul Douglas from the University of Chicago put forward what became known as the *Chicago Plan*. The Chicago plan was endorsed by Milton Friedman, James Tobin and Hyman Minsky and, as King notes, "more recently, similar proposals have been floated by John Cochrane from Chicago, Jaromir Benes and Michael Kumhof from the IMF, the British economists Andrew Jackson, Ben Dyson and John Kay, Laurence Kotlikoff from Boston and the distinguished *FT* commentator Martin Wolf."[26]

Under the Chicago Plan, commercial banks would not be permitted to create money by lending more than they hold in cash reserves. Banks would be required to back their lending with 100% liquid deposits. In the words of Irving Fisher,[27]

> "We could leave the banks free ... to lend money as they please, provided we no longer allowed them to manufacture the money which they lend ... In short: nationalize money but do not nationalize banking."

Admati and Hellwig have made the weaker argument that banks should be required to maintain a ratio of at least 25% of tangible common equity to

[26] King (2016, pp. 262).
[27] Quoted by King, (King, 2016, pp. 263).

total assets. That plan would still permit fractional reserve banking in which banks do 'manufacture money' but it would reduce dramatically the risk to the taxpayer in the event of a banking panic.

The Chicago plan, and the weaker Admati-Hellwig variant, have wide support among economists. King weighs into this debate by arguing that regulatory reform is unpopular among a powerful banking lobby that benefits from state subsidies. Drawing instead on an insight from the American Journalist William Leggett, King urges the development of a new policy that he calls the Pawnbroker for All Seasons (PFAS).

> The essential problem with the traditional LOLR is that, in the presence of alchemy, the only way to provide sufficient liquidity in a crisis is to lend against bad collateral – at inadequate haircuts and low or zero penalty rates. Announcing in advance that it will follow Bagheot's rule – lend freely against good collateral at a penalty rate – will not prevent a central bank from wanting to deviate once a crisis hits. (King, 2016, pp. 269).

The problem, as King sees it, is that once a crisis hits, a central bank will have an incentive to lend against all collateral, good or bad. His solution, the PFAS, is to require those private financial intermediaries that might potentially draw on the liquidity facilities of the central bank in times of crisis, to deposit adequate collateral with the central bank *in advance*. He describes three features of this new policy.

First, all deposits would be backed either by cash or by guaranteed contingent claims on reserves held at the central bank. Second, the cost of liquidity provision would be mandatory and paid up front. And third, the financial institutions that benefit from emergency liquidity provision would be required to bear the cost in advance. "The regulatory requirement on banks and other financial intermediaries would be that their effective liquid assets should exceed their effective liquid liabilities." The PFAS is a flexible version of the Chicago Plan that allows some discretion in the form of safe assets that are held as collateral.

How quickly could the PFAS plan be implemented? If it were implemented immediately, financial institutions, faced with the demand to lower leverage, could respond in one of two ways. They could raise fresh equity capital on the financial markets. Or, they could call in existing loans. King recognizes that, if the PFAS were to be implemented overnight, the result would likely be the immediate triggering of a financial crisis as banks, forced to hold a larger ratio of equity to assets, would respond by calling in existing loans. The solution, he asserts, is to implement the policy gradually, perhaps over the next twenty years.

Should financial institutions that benefit from implicit bailout guarantees be required to hold much larger equity buffers? In my view, yes. But would that be enough to prevent future financial panic?. In my view, no. There is a second problem which King recognizes, but which is, in my view, more significant.

> As with any reform of this kind, the scheme would apply to all financial intermediaries, banks and shadow banks, which issued unsecured debt with a maturity of less than one year above a *de minimus* proportion of the balance sheet. ...
>
> ...A key challenge is to ensure that alchemy does not simply migrate outside the regulated sector, and end up benefitting from an implicit public subsidy. (King, 2016, pp. 274)

The regulator who tries to correct problems with existing institutions is playing a game of whack a mole. An effective policy must be more than a response to existing institutional structures; it must solve a more fundamental problem. Institutions are not fixed points. They evolve as ways of implementing trades that private citizens perceive to be in their own interests. King himself claims that it is easy to spot when the world economy is in disequilibrium. I agree. Financial regulators can only avoid crises if they have tools that enable them to correct market disequilibria when they arise. The PFAS goes some way in this direction, but it does not provide the necessary tools to prevent the next crisis. The free market is a wonderful institution; but like a wild horse that will throw an unwary rider, the market must be tamed before it can be ridden.

10 Financial Crises: Institutional or Systemic?

Mervyn King's discussion of the role of central banks is a fascinating read, coming as it does, from a practitioner who was deeply involved in influencing the way that the 2008 financial crisis unfolded. His analysis does not follow the recent trend towards New-Keynesian theorizing and the use of rational expectations sticky-price models. That is welcome since that approach is widely perceived to have been discredited.[28] Instead, King's analysis is rooted in the belief that economies are all about coping with radical uncertainty. While King's idea is poetic, it is not an alternative to sound economic theory.

Financial crises are associated with bank runs and moral hazard. But they are much more than that. During the most recent financial crisis, financial institutions in the U.S. and the UK held large quantities of assets of questionable value. Were those assets worth ten cents on the dollar, or were they worth 110 cents? In my view, both answers are correct. If people believed that the assets were worth 10 cents, there was an equilibrium of the world economy in which that forecast would have become a self-fulfilling prophecy.[29] It is the job of the central bank and the treasury to ensure that, in times of crisis, it is the good equilibrium in which the assets are worth 100 cents, that prevails.

[28] The Queen of England, who is reported to have lost twenty-five million pounds in the financial crisis, was famously quoted as asking "Why didn't anyone see it coming?"(Pierce, 2008). The subsequent fall-out has led to widespread disillusionment with experts and with economics experts in particular (Chang, 2014).

[29] See my book, *The Macroeconomics of Self-Fulfiling Prophecies,* where I make the case that macroeconomies are characterized by self-fulfilling waves of optimism and pessimism that should be treated as fundamentals (Farmer, 1993).

Most economists who have thought deeply about the nature of economic crises, would be willing to ascribe a role to multiple equilibria. The deeper question, and one that I address in my own recent books and papers, is: Are crises caused by institutional failures that can be solved by new regulations added to existing institutions, or are they systemic?[30]

King's analysis is consistent with an institutional explanation. There is a multiplicity of equilibria, but that multiplicity arises from a lack of trust and it is intimately connected with the alchemy of credit.

While the alchemy of credit creation is surely a contributing factor to the severity of financial crises; it is not, I believe, the cause of those crises. Are bankers greedy? Was fraud rampart in the U.S. housing market? Do Wall Street bankers have undue political influence? Is there a revolving door between Wall Street and Congress, the Bank of England and the City of London.? Most certainly: and these are all contributing factors that were more or less important in perpetuating the misery that resulted from the 2008 global collapse. But all of these factors pale in comparison to a more significant feature of market economies: Free trade in financial markets does not, except by accident, result in an efficient intertemporal allocation of capital.

I will elaborate on that point in the next section, since it is, I believe, *the central issue* for modern macroeconomics.

11 Two Concepts of Market Efficiency

The efficient markets hypothesis is a term coined by Eugene Fama to denote the idea that it is difficult or impossible to make money through trades in the financial markets unless you know something that somebody else does not know. Fama refers to that idea as informational efficiency and there is a large finance literature which argues, persuasively, that markets are efficient in this sense.[31] It is unfortunate that Fama used the term efficiency to describe this concept because it has nothing to do with the way that economists typically use that term.

Much of modern finance theory is based on microeconomic concepts borrowed from general equilibrium theory. Under some very special circumstances, general equilibrium theorists have shown that every economic equilibrium is efficient in a well-defined sense: There is no intervention by a government agency that can improve the welfare of one person without making someone else worse off. That proposition is referred to as the first welfare theorem of economics and the efficiency concept, named after Vilfredo Pareto, is called Pareto Efficiency.[32] Importantly, a market that is informationally efficient is not necessarily Pareto efficient.

General equilibrium theory as applied to financial markets, assumes that the human beings who trade with each other in markets have perfect knowledge of

[30] Farmer (2008, 2010a,b, 2012a, 2013b, 2014, 2016).
[31] Fama (1970).
[32] Pareto (1906).

the probability distributions of future outcomes. It is a theory of risk rather than uncertainty and, while I agree with King that that is an inaccurate characterization of the real world, I am willing to accept the 'as if' assumption that the world is characterized by risk rather than uncertainty in order to highlight a second, more significant characteristic of markets.[33] Most of the people we are trading with through the purchase and sale of financial assets have not yet been born.

Macroeconomic theorists often assume that there exists a single representative agent. That assumption is convenient because the mathematics of a model, populated by a representative agent, is relatively simple. A single person facing a decision problem will always choose a unique action. But a person interacting with other human beings, most of whom have not yet been born, is a very different matter. Even if the physical world were unchanging, we would still face uncertainty as to the ways that our descendants will behave in the future. A model, populated by overlapping generations of finitely lived people, *always has multiple equilibria.*

When we trade with other people in markets, we each make implicit assumptions about what we think will happen in the future. Our expectations of what will happen influence the way we behave. And when there are multiple right answers to the question: how will future people behave? beliefs about what will happen have the potential to become self-fulfilling prophecies by influencing what does happen.

In the economic models that I study in my own theoretical and empirical work, the non-stationary paths for borrowing and lending that Mervyn King refers to as disequilibrium, are rational from the perspective of individual traders, even though they may be very far from optimal from the perspective of society. Stock market booms and crashes are not only individually rational: They are equilibrium paths for asset prices.[34]

But the fact that stock market booms and crashes are rational from the perspective of the individual, does not mean that they are rational from the perspective of society. The market can remain irrational for longer than you and I can remain solvent. The market can remain irrational for longer than George Soros or Bill Gates can remain solvent. But the market cannot remain irrational for longer than the U.S. Treasury can remain solvent. A national central bank, backed by the ability of the treasury to levy taxes on future generations, could make the trades that our children and our grandchildren would make if they were able.

My empirical work demonstrates a strong and stable connection between asset market fluctuations and variations in the unemployment rate three months

[33] See the discussion of this issue in my paper, 'Post-Keynesian Dynamic Stochastic General Equilibrium Theory' (Farmer, 2017). I also provide a defense of the use of the rational expectations assumption in *Prosperity for All* (Farmer, 2016, Ch. 9).

[34] I am using the word equilibrium here in the sense of Dynamic Stochastic General Equilibrium Theory: At every point in time, the quantities of assets demanded and supplied are equal at current prices.

later.[35] And my theoretical work provides a theory of unemployment that explains the connection between the stock market and unemployment as a causal chain.[36] When we *feel* wealthy we *are* wealthy. Increased consumption expenditure triggers additional hiring by firms, unemployment falls, and beliefs about the value of our financial assets become self-fulfilling.

Phil Oreopolous, Till Von-Wachter and Andrew Heisz have shown that job-market entrants whose first job occurs in a boom can expect to earn up to 15% more over their entire careers than those whose first job occurs in a recession.[37] If, in some alternative universe, those people could buy or sell assets, contingent on the state of the world they were born into, those trades would act to counter the asset price volatility that is responsible for the fluctuations in their fortunes.[38]

The fact that government can make trades on behalf of future generations provides a compelling rationale for providing real teeth to bodies like the Financial Policy Committee in the UK. The FPC could actively intervene in asset markets by trading risky claims to an indexed stock market fund, in exchange for government bonds.[39] The goal of an intervention of this kind would be to maintain full employment and it would run in parallel to the role of the Central Bank as the provider of a stable currency.

12 Concluding Thoughts on Financial Policy

Mervyn King has written a very interesting book and I recommend it to all who seek to further their understanding of the 2008 financial crisis and to those who are seeking wisdom on ways to prevent future crises. King's version of the Chicago plan, the Pawn Broker for All Seasons, has merit and a version of his plan has already been endorsed by a wide range of economists. Although I also endorse a version of the Chicago Plan, it does not, in my opinion, go far enough.

As Mervyn King argues, the world capital markets were clearly in disequilibrium in the early 2000s. Central Bankers, including King, did see a crisis coming. They did nothing about it because the experience of the 1987 crash made them overconfident of their ability to prevent a financial crisis from spilling over from Wall Street to Main Street. That hubris appears, after the fact, to have been misplaced.

[35] Farmer (2012b, 2015).

[36] Farmer (2012a).

[37] Oreopoulos et al. (2012).

[38] Some might argue that we do not need government to solve that problem; concerned parents can make those trades on behalf of their descendents. But even if we could trust that all parents truly have the welfare of their children at heart, that solution is infeasible since it would require that children receive bequests in some states of nature that are paid for by debts in others. Because western legal codes prevent debt-bondage, a private solution to the insurance problem is infeasible. For an elaboration of this argument, see Farmer (2016).

[39] I explain this argument in more depth in a lecture I delivered at the Bank of England, in memory of John Flemming, (Farmer, 2013a), and in my book, *Prosperity for All* (Farmer, 2016).

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