UNITED STATES MONETARY POLICY IN THE POST-BRETTON WOODS ERA

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Abstract: The Crash of 2008 is often blamed on the Fed’s overly ‘loose’ monetary policy after 2001 (see Taylor, 2009, 2010). In short, the argument goes, American monetary policy was too ‘loose’ for four years between 2002 and 2006; and too ‘tight’ once the Fed realised that it was presiding over an unsustainable boom.

This paper argues that the causes of 2008 and its aftermath (i.e. the stuttering ‘recovery’ once financial markets were successfully stabilised) run much deeper than ‘suboptimal’ monetary policy by the Fed. It argues that, by the end of the 1970s, the Bretton Woods system had been replaced with a ‘brave new’ global surplus recycling mechanism in which Wall Street and the rest of the West’s large private banks featured prominently. These developments engendered a new form of ‘private money’ over which the Federal Reserve had decreasing control. Thus, if the Fed did indeed lose control over the effective money supply it lost it not because of any ‘deviation’ from Taylor-rule-based central banking but, rather, because of a major shift in the global role of finance.
To understand why the Fed lost much of its influence over the aggregate money supply we first need to understand how this new form of private money had become an indispensible aspect of the aforementioned recycling mechanism. Wall Street’s generation of private money was, in fact, functional to the recycling of global surpluses upon which the ‘Great Moderation’ was founded. This put the Fed in an impossible dilemma: Should it re-assert its control over the effective money supply at the expense of ending the illusion of the Great Moderation? Or should it stick to Taylor-rule like central banking? This paper argues that the Fed opted for the latter.

The paper is structured as follows. Sections 1 and 2 offer a non-technical analysis of the arguments outlined above. Section 3 turns to the post-2008 period and asks: Given that the official sector stabilised financial markets, why has recovery proved so tepid? The answer Section 3 provides is an extension of the analysis in Sections 1&2 regarding the true causes of the Fed’s loss of control over the effective money supply well before the Crash of 2008. Along the same lines, it presents a particular critique of the Fed’s Quantitative Easing policy. Section 4 concludes.

In addition to its four main sections, the paper offers three analytical appendices. Appendix 1 presents empirical evidence of the Fed’s loss of control over the effective money supply. Appendix 2 supports these observations with a fully dynamic game theoretical analysis of the Fed’s conundrum during the 1980-2008 period. Lastly, Appendix 3 focuses on the unrealistic assumptions under which Quantitative Easing might spearhead recovery.

Key words: Federal Reserve, Central Bank Games, Financial Crisis, Taylor Rule, Monetary Policy, Quantitative Easing.

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Did the Fed cause the Crash of 2008?

“Why did the Great Moderation end? In my view, the answer is simple. The Great Moderation ended because of a ‘Great Deviation’, in which economic policy deviated from what was working well during the Great Moderation. Compared with the Great Moderation, policy became more interventionist, less rules-based, and less predictable. When policy deviated from what was working well, economic performance deteriorated. And lo and behold, we had the Great Recession.” John Taylor [See Taylor (2010), p.166]

It has become almost conventional wisdom that 2007/8 was the ‘moment’ a series of bubbles burst that had been inflated by overly loose monetary policy following the recession of 2001. John Taylor’s views on this (see Taylor, 2009, and Taylor, 2010) have been particularly influential, possibly because most central banks had previously subscribed to his simple rule, known as the Taylor Rule (see Taylor, 1993), for the purposes of setting nominal interest rates.

Taylor’s (2009, 2010) claim is predicated upon three controversial hypotheses. First, that the Fed violated its own Taylor rule after 2001, allowing itself to indulge in discretionary monetary policy. Secondly, that this ‘Great Deviation’ (from rules-based central banking) led to an unsustainable boom in real estate and finance that ended the Great Moderation. Thirdly, that the Fed’s response post-2008, along the lines of Quantitative Easing, corresponds to yet another deviation from rules-based central banking, thus foreshadowing not only greater inflationary pressures in the future but also a loss of potential output and a substandard recovery.

This paper argues that each of these hypotheses are faulty. In particular, it will argue (a) that the Fed’s pre-2008 interest rate setting remained more or less wedded to its prior Taylor-rule
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policy framework; (b) that, while the Fed did lose control over monetary policy, the reason was not an unwillingness to raise interest rates but that it was due to developments in the financial sector over which the Fed’s monetary policy had very little influence, and (c) that, while Quantitative Easing cannot invigorate the real economy, it poses neither a serious ‘crowding out’ threat nor an inflationary risk.

Section 1 - There was no ‘Great Deviation’

Taylor (2010) claims that his own rule instructed the Fed steadily to raise nominal interest rates from the middle of 2001, instead of continuing to push them down, as Alan Greenspan did until 2004. However, this is not an uncontested claim. To reach his conclusion, Taylor had to utilise price indices and measures of the output gap that Central Banks have good reason to avoid.

To see this, recall that the Taylor Rule prescribes nominal interest rates set equal to the rate of inflation plus the real interest rate that the economy requires in equilibrium, plus an amount proportional to the deviation of the inflation rate from the Central Bank’s inflation target and, lastly, minus another amount proportional to the output gap (i.e. the shortfall of aggregate output, or GDP, in relation to its potential level). More precisely, the Taylor Rule requires that:

\[ i_t = \frac{\dot{p}_t}{p_t} + r_t^* + \alpha\left(\frac{\dot{p}_t}{p_t} - \frac{\dot{p}_t^T}{p_t}\right) + \beta(y_t - \overline{y}_t) \]

where \( i \) is the nominal interest rate, \( r \) the real interest rate, \( \alpha \& \beta \) are constants between 0 and 1 (usually close to \( \frac{1}{2} \)), \( \frac{\dot{p}_t}{p_t} \) is the rate of price inflation, \( \frac{\dot{p}_t^T}{p_t} \) is the Central Bank’s inflation rate target, \( y_t \) is GDP and \( \overline{y}_t \) is an estimate of potential (full employment) GDP.
From the above it is clear that an assessment of whether the Fed followed or violated the Taylor Rule depends on our choice of (a) prices indices and (b) estimates of the output gap. Taylor’s (2009, 2010) claim that the Fed violated the Taylor Rule is based on empirics that utilise (i) a moving average of the US GDP price deflator and (ii) the raw unemployment rate. It is true that, on the basis of these data series, it is possible to demonstrate that the Fed’s nominal interest rate between 2002 and 2004 was lower than that prescribed by the Taylor Rule. However, this is not so if we use data series that seem entirely more appropriate.

Beginning with price data, the Fed itself does not use the GDP price deflator for the simple, good, reason that it is too volatile as it contains the price of oil, food prices and other such capricious data series. Instead, the Fed traditionally uses the consumption deflator excluding wholesale food and energy prices. Taylor (2010) argues that he discarded the volatility from his own price index, the GDP price deflator, by looking at moving averages of the deflator. However, the question is: Why try to remove the volatility of the GDP price deflator through averaging when it is much simpler simply to exclude the volatile variables from the dataset, as the Fed has traditionally done?

From Figure 1 below it is clear that, between 2002 and 2004 the CPI (black data series) was well below a three quarter moving average of the GDP price deflator (blue data series). Thus, if the Taylor Rule is based on the averaged GDP deflator, Taylor’s (2010) argument that the Fed ought to have raised interest rates in 2002 is supported. However, if we use CPI data, the claim that the Fed’s actual nominal interest rates during the 2002-2004 period were ‘too low’ is weakened substantially.
Turning now to estimates of the United States economy’s output gap, \((\bar{y}_t - y_t)\), Taylor (2010) claims that it fell substantially after 2002 and, therefore, monetary policy ought to have ‘tightened’ as a result independently of which price index we use. However, his evidence of the drop in the output gap is confined to the observation that the rate of unemployment fell to below its ‘natural rate’, reaching 4.5%.

Figure 1 – United States Consumer Price Index (black data series) versus a three quarter moving average of the United States GDP price deflator (blue data series). Source: US Bureau of Economic Analysis
Figure 2 – United States Unemployment Rate in % [black data series] versus Capacity Utilisation in % [blue data series]. Source: US Bureau of Economic Analysis

But, as is clear from Figure 2 (see the black time line), this did not happen during the 2002-2004 period (which, according to Taylor, 2010, was one of overly loose monetary policy). Unemployment did not, in fact, begin to dip until the end of 2003. Moreover, and more importantly, it is clear (see the blue time line) that during the contentious period 2002-2004 the American economy was nowhere near the levels of capacity utilisation observed prior to the 2001 recession. In this important sense, the Taylor Rule itself was never violated by Alan Greenspan’s Fed in the aftermath of the 2001 recession.

In short, John Taylor’s claim that some ‘Great Deviation’, from his Rule, caused the end of the ‘Great Moderation’ seems to receive no support from a careful examination of the data since there is no evidence of such a deviation in the first place.

Section 2 - The ‘Great Moderation’ was always predicated upon an unstable global surplus recycling mechanism

"Imagine a situation where natural and equilibrium interest rates have fallen significantly below zero. Then conventional macroeconomic thinking leaves us in a very serious problem because we all seem to agree that, whereas you can keep the federal funds rate at a low level forever, it’s much harder to do extraordinary measures beyond that forever, but the underlying problem may be there forever." Larry Summers, 2013.²

Larry Summers’ recent IMF speech offers a different perspective to that of John Taylor. The problem was not, according to Summers, that nominal interest rates were set at too low a
level before and after the Crash of 2008 but, rather, the problem has been that, due to changes in the nature of the global economy, the second term in the Taylor Rule above, the equilibrium real rate of interest ($r_t^e$), may have turned permanently negative well before 2008. According to this harrowing view, the Fed, even if it had remained utterly faithful to the Taylor Rule, (A) could not have deflated the bubbles in the real estate and financial sectors prior to 2008 and (B) is powerless to stabilise the real economy post-2008.

But what does it mean to say that the equilibrium level of real interest rates has become negative? And how could we have reached this stage?

Beginning with the ‘meaning’ of a negative real equilibrium interest rate, Professor Summers’ explanation, if correct, means that to mobilise the post-2008 mountain of idle savings, and encourage them into becoming productive investments so as to bring about the much needed recovery, savers must be penalised by negative real interest rates! Clearly, in a free market economy this is problematic since savers will respond to any monetary policy that penalises them by taking money out of the financial system and hoarding them under their mattresses or, in the case of corporations, in places where the Fed cannot reach. Moreover, the Fed’s situation is impossible in the sense that, on the one hand, it can ill afford to taper its Quantitative Easing efforts while, on the other hand, it is ill equipped to solve the underlying problem simply by carrying on as at present.

Having dismissed Taylor’s [2009, 2010] explanation of the crisis and its aftermath as both empirically weak and theoretically epidermic (see previous section), I will now attempt to offer an explanation of why the equilibrium real interest rate may have become consistently negative, of why the Fed lost control of the effective money supply, and why the Fed’s capacity to spearhead recovery is as severely circumscribed as its pre-2008 ability to avert the Crash of 2008.
To piece together this explanation we need to start at the end of the Bretton Woods system; a global system that operated well for two decades while the United States was recycling its surpluses to Europe and Japan; a global system that, nevertheless, could not but collapse once the United States lost its capacity to recycle its surpluses as it slipped from a global surplus to a global deficit position some time toward the end of the 1960s. After a tumultuous early 1970s, a new, quite remarkable, global surplus recycling system emerged, from the ashes of Bretton Woods. What made it remarkable was that for the first time in the annals of political economy the hegemonic nation increased its dominance by expanding massively its deficits and, thus, succeeded in recycling other nations’ surpluses.

Indeed, from the 1970s onwards, the United States began absorbing an increasing portion of the Rest of the World’s surplus industrial products. America’s net imports were, naturally, the net exports of surplus countries like Germany, Japan and later China; the main source of their aggregate demand. In turn, approximately 70% of the net profits earned by the surplus nations’ entrepreneurs were channelled, daily, to Wall Street, in search of higher returns.

Central to this turn-around, and the audacious global surplus recycling mechanism that it brought into being, was the US Federal Reserve which, particularly under the chairmanship of Mr Paul Volcker, played a crucial role in establishing the monetary stance that allowed the American economy to evolve into a massive attractor of both the rest of the world’s net exports and of its surplus capital (that flowed daily, and in great abundance, to Wall Street). Wall Street used this influx of foreign capital for three purposes: (a) to provide credit to American consumers, (b) as direct investment into US corporations and (c) to buy US Treasury Bills (i.e. to fund the American government deficits).

This steady torrent of capital inflows into the United States was the ‘foundation’ on which the miracle of financialisation was erected. It provided the impetus for converting ‘plain vanilla’
options-to-buy into fancier securities whose structure increased in complexity in proportion to the rise in computing power. The combination of exponentially rising computing power with increasing net capital inflows allowed Wall Street to mint financial ‘products’ that combined greater opacity (regarding their actual value) with greater exchange value and, following the magic of securitization, the illusion of riskless risk. Soon, these ‘products’ began to operate, at least within the global financial sector, as a means of exchange and a store of value. It was not long before Wall Street, and its City of London simulacrum, had access to the equivalent of a printing press, minting private money almost at will.

The Fed and the other central banks had very little control over this private money supply to the extent that the latter’s foundation was, primarily, the net capital inflows from the Rest of the World that were essential to the financing of US net imports as well as of the US federal deficit. Moreover, a contractionary monetary policy by the Fed would have done nothing to stem Wall Street’s private money production. In a sense, the Fed had lost control of the effective money supply: When it tightened monetary policy, Wall Street’s minting presses were fuelled by an increase in net capital inflows. And when it loosened its monetary policy, any losses in capital inflows were compensated for by a rise in domestic asset prices (e.g. house prices) that provided Wall Street with the missing raw materials for continuing to pump up its private money supply.

Importantly, the Fed’s loss of control over the effective money supply underpinned the Great Moderation as it proved functional to the stabilisation of US demand for the net exports of Europe and Asia, thus allowing for high growth combined with low price inflation rates. Moreover, the Fed’s credibility as a rules-based central banking authority, immune to political pressure, often worked against it in its tussle, with Wall Street, to remain in control of interest rate spreads throughout the economy (see Appendix 2 for a game theoretic analysis).
It is in this sense that what Ben Bernanke and John Taylor mistook for some fictitious ‘Great Moderation’ was founded on a highly immoderate, grossly unstable global surplus recycling system over which the Fed had next to no power. It was, moreover, this very recycling system that broke down in 2008 once the pyramids of Wall Street’s private money exceeded a tipping point, causing the secular loss in aggregate demand which explains the tepid ‘recovery’.  

Section 3 – Why has the recovery been so tepid? Why has the equilibrium real interest rate fallen below zero sustainably?

When grains of sand are added on top of other grains of sand, inevitably the resulting sand hill will implode. While the implosion is certain, it is, as physics can demonstrate, impossible to predict the moment the implosion will occur. Similarly with the mountains of private money that Wall Street was minting and which the Fed had next to no control over: the collapse in those markets was inevitable while its timing was impossible to predict. Furthermore, empiricism can neither confirm nor deny the proposition that it was the Fed’s tightening in 2006 that brought the Crash forward. Maybe it did. On the other hand, perhaps it might have happened in 2007/8, or perhaps a little later, even if the Fed had refrained from pushing nominal interest rates up.

Regardless of the Fed’s role in triggering, or not, the avalanche, the fact remains that, once the financial sector collapsed, and soon after stabilised by the frenzied efforts of the official sector, the Fed found itself both in a liquidity trap. Nevertheless, long before that point (around the 1980s to be precise) the Fed had lost much of its influence over the determination of the American economy’s various interest rate spreads (see Appendix 2 for a complete game theoretical analysis).

The grand question for our times thus arises: Why has economic activity not recovered fast after finance was, more or less, stabilised? How come twenty million Americans who would
like a full time job today cannot find one after five years of zero nominal interest rates and so much Quantitative Easing on the Fed’s behalf? Why is it that the recovery we have observed after 2008/9 was so much weaker than anything we have seen after past sharp downturns?

Indeed, if my argument in the previous section is correct, and it was the US twin deficits (trade and budget deficits) that succeeded in creating generating the requisite aggregate global demand, and thus the illusion of a global ‘Great Moderation’, why has the latter not returned both to the United States and globally now that the US twin deficits are back with a vengeance?

The answer this paper puts forward is this: Following the Crash of 2008, and despite the ‘reflation’ of global finance courtesy of monetary authorities and the taxpayer, Wall Street has lost, possibly irretrievably, its capacity to ‘close’ the global surplus recycling loop. America’s financial sector can no longer harness the United States’ twin deficits for the purposes of financing enough demand within America to keep the net exports of the rest of the world going (a financing process that, until the Fall of 2008, tapped the rest of the world’s surplus profits which these net exports produced). From that dark moment onwards, the world economy would find it exceedingly hard to regain its poise – at least not without an alternative global
surplus recycling mechanism. This is the underlying reason for the phenomenon that Larry Summers put so succinctly in his recent speech at the IMF [see the beginning of Section 2]: the persistently negative equilibrium real interest rate.

Figures 3,4,5&6 are presented in support of the above hypothesis. To see why the United States has lost its capacity to recycle other nations’ net exports at the pre-2008 pace, it suffices to note that in 2011 the United States was generating 23.7% less demand for the Rest of the World’s net exports than it would have been without the Crash of 2008 – see Figure 3. Secondly, and at the same time, America was failing to attract (through Wall Street) the level of capital flows which would be necessary to maintain the pre-2008 pace of investment into its private sector – see Figure 4. To be precise, by 2011 the United States had lost 56.48% of the assets held by foreigners compared to the (trend) level that would have been held had the Crash of 2008 not happened. The main, and indeed crucial, reason for this precipitous decline was that foreign net capital flows ending up as loans to US corporations fell drastically from around $500 billion in 2006 to -$50 billion in 2011 – see Figure 5. So, while the rest of the world continued to buy US Treasuries en masse [see Figure 6] what has not been resuscitated is the mechanism by which US net imports were being recycled by means of (a) injections into the aggregate demand enjoyed by net exporters and (b) capital flows from the rest of the world into corporate America.
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Figure 3 – US goods trade deficit with major Surplus Countries (including the Eurozone’s Surplus Member-States, China, Hong Kong, Japan and Korea) – *Source: US Bureau of Economic Analysis*
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Figure 4 – Foreign Assets in the US except derivatives. *Source: US Bureau of Economic Analysis*

Non-US residents reduced their holdings of US assets by more than one half

56.48% down compared to trend value

Figure 5 – Corporate Bond Purchases (net) by non-US residents. *Source: US Bureau of Economic Analysis*

Foreigners shift from the position of (massive) net lenders of US corporations to net borrowers!
By 2013 these trends have crystallised into a devastatingly simple picture: On the one hand, the Crisis did not alter the deficit position of the United States [the federal budget deficit more or less doubled while America’s trade deficit, after an initial fall, stabilised at the same level as before] while, on the other hand, the US deficits are no longer capable of maintaining the mechanism that keeps the global flows of goods and profits balanced at a planetary level.

Whereas until 2008 America was able to draw into the country increasing mountains of net imports of goods, and a similar volume of capital flows (so that the two balanced out), this is no longer happening post-2008. Compared to pre-2008 trend values, American markets are sucking 24% fewer net imports (thus generating only 66% of the demand that the Rest of the
World was used to before the Crash of 2008) and are attracting into the American private sector 57% less capital than they would have had Wall Street not collapsed in 2008.

In short, the only reminders that remain of the kind of global economy in which Wall Street performed a crucial recycling role, only scantily supervised by US monetary authorities, are the still accelerating flows of foreign capital into America’s public debt, evidence that the world is in disarray and, in this age of tumult, money is desperately seeking safe haven in the bosom of the reserve currency. But as long as the rest of the world is reducing its injection of capital into America’s corporate sector and real estate, while America is reducing its imports of their net exports, it is no great mystery that the Fed finds it difficult to restore the growth rate necessary to ameliorate for the Great Recession’s impact.

In conclusion, Section 2 argued that before 2008, in view of Wall Street’s new role as an issuer of private money, the Fed would have to use ‘unconventional’ methods (that Taylor Rule-like central banking ideas and principles would never even recognize, let alone endorse), in order to re-assert its control over the aggregate money supply. Section 3 added to this the argument that, post-2008, even unconventional methods have no handle over the problem of insufficient investment which leads to insufficient aggregate demand both within the United States and globally. In fact, this is the very reason why the Fed’s Quantitative Easing, while innocent of the horrors that its detractors accuse it of, is no match to the task in hand and has failed to kick start a clear cut Recovery (see Appendix 3 for an analysis of Quantitative Easing’s inesapable feebleness).

Section 4 – Conclusion

Soon after Bretton Woods was dismantled, the United States began to attract massive capital inflows. Seizing the opportunity that the oil crisis and rising unemployment presented to management, US corporations discovered that the bargaining power of labour unions was
withering under the panic of the 1973 crisis and took instant advantage of this major development. Real median wages fell precipitously, never to recover since. Between 1977 and 1998, the real hourly wage of American workers (excluding the wages of corporate managers) fell by 14%. When later, in the period 1985-1990, American unit labour costs almost stayed still, Germany’s and Japan’s were growing at a rate closer to the rate of productivity rises. Thus the capital flight into the United States picked up speed.

By the time the capital flights from Germany and Japan to New York had began in earnest, thus causing wages to deflate there too (in the early 1990s), the collapse of the rate of increase in labour costs in Europe and Japan could no longer match the fall in US labour costs – see Figure 7.
Whereas low US labour costs were only one (relatively insignificant) factor underpinning the mechanism by which surpluses were being recycled, they certainly helped reinforce the capital flight to the United States. Thus, US corporate profits were buoyed by a convergence of synergistic factors:

- Wall Street would pass on the inflowing foreign capital to corporate America, which used the cash to buy itself more global oligopoly power (i.e. to purchase excess capacity at home and abroad)
- Corporations doubled in profitable financial transactions on the coattails of such a cash flood (e.g. General Motors, which created a division trading in financial products that grew to be larger than its car making units); and
- Declining labour costs.

While a bubble was building up in Wall Street and in American suburbia as these processes were unfolding, and consumption was being fuelled by borrowing on the strength of those rising ‘assets’, the Federal Reserve was busily pursuing its Taylor Rule, with only occasional
[but never-acted-upon] concerns about this bubble and regarding its increasing inability to control either the aggregate money supply or, importantly, interest rate spreads (see Appendix 2). The world’s capital reinforced the US multinational corporations that had, since the days of Edison and Ford, been the foundation of the US economy. While most Americans were not linked with the parts of corporate America that paid its employees handsome rewards, and had to turn to Wall Street for sources of spending power, the corporations were, indeed, growing more interwoven with the financial sphere, more technologically astute, and less bothered by sizeable global competitors.

Throughout this financial-cum-economic ‘miracle’, the Fed was enjoying power over the supply of public money in inverse proportion to its reputation for independence and command over the supply of what this paper has described as private money (i.e. the financial sectors’ instruments that evolved into a type of currency used extensively within the financial sector itself). While neoclassical economic models (see Appendix 2 below) have some capacity to demonstrate how the Fed lost control of the aggregate money supply (once the financialisation added a third player to the game between politicians and a central bank), no neoclassical model can capture a central feature of money since the end of Bretton Woods: its endogeneity. Post-Keynesians have, in contrast, valiantly striven to theorise endogenous private money creation, of the sort that we have been witnessing before the Crash of 2008, with important implications regarding our understanding of the Federal Reserve’s struggle against the liquidity trap that the Crash occasioned.

Nevertheless, with some exceptions (e.g. Arestis and Eichner, 1998, and Sawyer, 2002) these post-Keynesian treatises have not shed much light on the theory and practice of actual monetary policy. In an era when central banks have lost control of monetary policy, in the aggregate, and are anxiously fighting to regain control over it, e.g. through Quantitative Easing, the inability of even post-Keynesian theory to issue clear recommendations to central banks
offers confirmation that, post-1971, American and European capitalism has been increasingly relying on monetary policies whose functioning the monetary authorities have a decreasing grasp of.

Lastly, with Quantitative Easing being the only instrument left to the Fed after six long years of failing to return American capitalism to a respectable level of self-reinforcing growth, pressing questions emerge about the ill effects of Quantitative Easing. While it is quite true that inflation is a false fear (for reasons explained in Appendix 3 below), as are the cries over imagined ‘crowding out’ effects, this does not mean that there are no legitimate concerns. For while inflationary dynamics pose no threat in the current state of the United States, or indeed the global, economy, there is a clear and present danger of another bubble bursting in the equity, bond and derivatives market.

Figure 8 tells an uncomfortable tale. Whenever the Fed’s overnight, or short-term rate, trails significantly nominal GDP growth, there soon comes a time when the money markets meltdown. This has been the case in (a) the mid-1990s, yielding the South East Asian crisis, (b) the late 1990s, sparking off the dot.com crisis, and (c) the period following the dot.com collapse, which occasioned the Crash of 2008. Compared to these episodes, Quantitative Easing’s relative success in stabilising the American financial institutions as well as the labour market (albeit at well below full employment levels) has, nonetheless, caused the greatest and longest spread between nominal GDP growth and short-term interest rates. We should not be surprised if reliance on the Federal Reserve’s Quantitative Easing policies, as a bulwark against stagnation, produces a significant bust in financial markets; one that will catch Treasuries, and social fabrics, the world over in perhaps their weakest state ever; and deeper in the liquidity trap than ever before in economic history.
Figure 8 – A new bubble seems to be forming
The blue time series depicts US nominal GDP growth whereas the brown time series tracks the Fed’s short-term interest rate.

Epilogue

The Crash of 2008 was not the result of the Fed having abandoned its Taylor Rule in favour of a return to the discretionary monetary policies of yesteryear. While the Fed had, indeed, lost control over the aggregate money supply, this was not due to some erroneous application of its Taylor Rule but, rather, the result of a global sea change which, following the demise of Bretton Woods, allowed the financial sector to decouple from both the official sector and the ‘real’ economy. And when Wall Street’s exploitation of this novel ‘exorbitant privilege’ led to the Crash of 2008, the unstable global surplus recycling mechanism that had been maintaining the illusion of some ‘Great Moderation’ broke down. Put simply, Wall Street’s capacity to ‘close’ the loop of global surplus recycling seems to have been irreparably damaged. No monetary authority can, without the assistance of government, repair a broken down global surplus recycling mechanism against the powerful interests of a financial sector that grew even stronger, politically, after 2008; especially when the missing global surplus recycling
mechanism requires inter-governmental cooperation not dissimilar in scope, if not necessarily content, to another Bretton Woods conference.
Appendix 1 - The Federal Reserve: From monetary overlord to loss of control

Central to this paper’s hypothesis is the proposition that US monetary policy was only a secondary factor in the process that allowed finance to build up unsustainable paper asset values. While the Fed’s actions under Paul Volcker in the late 1970s and early 1980s, through the imposition of historically high nominal interest rates, played a major role in establishing the global capital flows into Wall Street, on the back of which the process of financialisation was established, financialisation itself, once on a ‘roll’, would have proceeded regardless of the low interest rate policies pursued by the Fed following the bursting of the dot.com bubble in 2001. Indeed, the causes of financialisation are to be found elsewhere; e.g. developments in the US labour market and the rise of the inequality (see Galbraith, 2012), the changing nature of domestic US oligopoly capital, the energy market. It is in this context, of emphasizing the centrality of planned, though unruly, global imbalances that financialisation is to be explained.

With regard to deregulation, while the removal from the statutes of the Glass-Steagall Act was a significant psychological turning point, nevertheless it is arguable that deregulation was the inevitable repercussion of the newfangled surplus recycling mechanism which the United States had, de facto, put in the place of the defunct Bretton Woods system - with great benefits for US hegemony. Just as in the case of monetary policy, so too deregulation should be seen as a byproduct of a deeper shift in the world economy’s dynamic structure, under the tutelage of Wall Street and its political ‘captives’, rather than as primary causes of pre-2008 developments.

Put differently, the problem with substantial regulation, of the type that was in force prior to 1971, is that it impeded the type of financialisation that was essential for the rebalancing of global recycling after the United States lost its external surplus position. The standard literature acknowledges that regulatory tightening of capital ratios can generate aggregate shocks, capital regulation can enhance the pro-cyclicality already inherent in banking,
capital requirements can influence macroeconomic outcomes and alter the monetary policy transmission mechanism (see VanHoose, 2008). Of course, prudent mainstream economists can always retort that these ‘costs’ of tighter control over finance by the central bank are a small price to pay for preventing the formation of bubbles whose bursting can cause not only the implosion of global finance but also, as we saw post-2008, a Great Recession. What if, however, lax control over the banking and shadow-banking sector are prerequisites for the type of capital flows that fuelled the ‘Great Moderation’ after 1980?

Taking a closer look at the conduct of US monetary policy and its real goods sector impact adds weight to the above perspective. Real output spurs in the US exceeded their historic average magnitudes in the 17 quarters before the 2003(Q3) peak by at least 1%. After the bursting of the dot.com bubble, and the commencement of the recession in 2000(Q4), the relative decline was even greater than the preceding growth spurt ever was (in absolute terms). Meanwhile, during the booms of the 1994-2000 era, the rest of the developed world saw fluctuations in real GDP growth that were much close to their historic levels – see Figure 9 below.

Meanwhile, US monetary policy also displayed signs that the American money markets had decoupled from the rest of the capitalist world. Figure 10 demonstrates that short-term interest rates were lower before the 1994-2000 boom, in comparison to historic averages, than the rest of the world, and fell precipitously after the recession began in 2000 in response to it. Across all post-Bretton Woods booms, the financialisation drive of Wall Street banks caused greater volatility not only in regard to output growth but also in terms of the Fed’s monetary policy response. Moreover, that volatility involved short interest rates that were consistently pushed well below those of the rest of the world.

Looked at from the perspective of real interest rates, see Figure 11, US monetary policy appears asymmetrical in the sense that, prior to booms, real interest rates were tracking international levels but, following the 2000 recession, the Fed pushed real interest rates more
than 7% below their spread from the rest of the world’s interest rates; a trend that only began to reverse ever so slightly 46 months after the end of the 2000 Wall Street peak.

Most poignantly, the term spread (i.e. the spread between US ten-year bond yields and the short-term interest rate), while trailing Rest of the World levels before the 2000 peak, spiked around 2001 and remained well above international levels throughout the period of maximal financialisation (2001-2007) – see Figure 12. This observation adds weight to that in Figure 10 as the term spread is often a better measure of the Fed’s stance regarding the degree of monetary policy loosening/tightening. The yawning ‘spread’ between the US term spread and that of the rest of the world (after 2001) confirms that the more the Fed believed that it could loosen or tighten monetary policy with impunity the less control it had of the effective monetary base.

Claiming that the Fed, under Alan Greenspan, had lost control of the money supply is not to argue that Mr Greenspan either abandoned inflation targeting (as Taylor, 2009, 2010, argues) or that he did not grasp the dangers of inflation targeting in an era of financialisation. Indeed, in the February 1997 FOMC meeting, Mr Greenspan reportedly made the point that: “…product prices alone should not be the sole criterion… if we are going to maintain a stable, viable financial system whose fundamental goal… is the attainment of maximal sustainably growth” – see Bordo and Wheelock (2007). In line with this position, the Fed increased short-term interest rates by 25 basis point in March 1997. However, as the industrial scale production of securitized derivatives was preceding with gusto at that time, the effect of this interest rate rise on the term spread was negligible and, consequently, the Fed had no impact on the aggregate or effective money supply.
Figure 9: A unique Wall Street boom – the peak of 2000

The **blue time series** depicts the real US Gross Domestic Product growth rate relative to its historic average for the twenty quarters before and the twenty quarters after Wall Street’s peak in 2000 (in real stock prices). The **black time series** plots the median growth rates of real GDP (relative to historic average) during market peak quarters and in the twenty quarters before and after market peaks across all post-1970 stock market booms in: the UK, the USA (including the US boom of 1994-2000), France, Germany, the Netherlands, Australia, Japan, Sweden, Canada, and Italy
This project has received funding from the European Union’s Seventh Framework Programme for research, technological development and demonstration under grant agreement no 266800.

Figure 10: Short-term US interest rates around the 1994-2000 Wall Street Boom

(Source: Federal Reserve Bank of St Louis)

The **blue time series** is monthly data depicting US Funds rate during the Wall Street boom of 1994-2000. The **black time series** plots the median level of short-term interest rates across all post-1970 booms in: the UK, the USA (including the US boom of 1994-2000), France, Germany, the Netherlands, Australia, Japan, Sweden, Canada, and Italy. Both series are depicted relative to their levels in the months of stock market peaks (month 0).
Figure 11: Real US interest rates around the 1994-2000 Wall Street Boom

The **blue time series** is monthly data on real US interest rates (nominal short-term interest rate minus the moving average yr-on-yr inflation rate) during the Wall Street boom of 1994-2000. The **black time series** plots the median level of the same variable across all post-1970 booms in: the UK, the USA (including the US boom of 1994-2000), France, Germany, the Netherlands, Australia, Japan, Sweden, Canada, and Italy.
This project has received funding from the European Union’s Seventh Framework Programme for research, technological development and demonstration under grant agreement no 266800

Figure 12: US Term Spread around the 1994-2000 Wall Street Boom

(Source: Federal Reserve Bank of St Louis)

The blue time series is monthly data on the spread between US 10yr bnd yields and the short term interest rate during the Wall Street boom of 1994-2000. The black time series plots the median level of the same variable across all post-1970 booms in: the UK, the USA (including the US boom of 1994-2000), France, Germany, the Netherlands, Australia, Japan, Sweden, Canada, and Italy.

At this juncture an interesting theoretical question emerges: Is it possible formally to account for this loss of control over monetary policy by a powerful, independent Fed that seems to understand the dangers posed by financialisation? Appendix 2 answers this question in the affirmative by means of a game theoretical model.
Appendix 2 - A game theoretical analysis of the constraints facing US monetary policy post-1971

A2.1 The rise of the ideology behind a fully independent Central Bank

As the Bretton Woods system was becoming a distant memory, and the imperatives of financialisation were gathering strength in the United States, a new ‘research agenda’ began to emerge, based on game theoretical arguments enabled by advances in game theory in the late 1970s and early 1980s. The new agenda’s focus was the necessity of reinforcing Central Bank ‘independence’ where it already existed and to usher it in where it did not (e.g. in the UK).

The standard argument was that democratically elected governments are likely to get caught in a game with the public which will lead to sub-optimal inflation outcomes. An obvious strategy abolishing this trap was to change the ‘game’ by taking monetary policy (at least partly) outside the democratic process. In a well known paper, Rogoff (1985) argued that, unless such institutional change is introduced, the authorities’ temptation to influence real variables would be fuelled by the public’s uncertainty. Later Cukierman (1992) showed that, if the government could vary the amount of uncertainty facing the public regarding monetary policy, it would choose to raise it above some irreducible minimum. A rational public would then anticipate this and form inflationary expectations which lock in a higher than necessary inflation rate prior to the government’s policy choice. Thus the government’s mere capacity to use uncertainty in order to alter real variables can lead to a cycle of expectations that curtail that capacity while engendering higher (and more variable) inflation. Even if a well-meaning government, having realised the vicious cycle it is caught in, wished to avert this inflationary cycle, there is little it could do to persuade the public to downgrade its inflation forecasts short of giving up its control over monetary policy.
A burgeoning literature thus emerged and many careers were built on its back during the period that was later to be described as the ‘Great Moderation’ by none other than Ben Bernanke. Rogoff (1985) argued that a truly independent, deeply conservative Central Banker would break the cycle at the cost of forsaking the authorities’ capability to adjust monetary policy in case of large real shocks. Barro and Gordon (1983) and Backus and Driffill (1985) replied that, even in the presence of finite horizons for both Central Banks and governments, these interactions are repeated often enough to trigger reputation-building behaviour which renders sound monetary policies credible. Others have proposed a distinction between instrument-independence and goal-independence with the government setting the target and the Central Bank (CB hereafter) being allowed leeway to pursue it.

For example it has been suggested that, unable to aim at a first-best solution (i.e. the removal of real shocks), a second-best would be an optimal contract inflicting a penalty on the CB which is linearly related to the divergence between actual and planned inflation. Those opposed to such an idea then retorted that optimal contracts are not sufficiently robust because the government has no incentive to punish a wayward CB and that, in reality, credibility can be achieved through CB independence without sacrificing flexibility simply because this trade-off is illusory.

A2.2 The missing game

It is interesting to note that this body of literature, in addition to having no underpinnings in any substantial theory of money, neglected the possibility that the CB may be involved in more than a single game at any one time. E.g. that, in addition to its interaction with the Treasury and elected politicians, the CB plays a vicious and crucial game against the banking and shadow banking sector whose influence in money creation is even more significant that even that of the CB. Never before have so many renowned economists purposely chosen to turn a blind eye
to such a crucial aspect of the phenomenon [i.e. monetary policy and its outcomes] under study!

Had they dared consider the game between the CB and the financial sector, they might have noticed that the CB’s optimal strategies become incredibly more difficult to work out not only courtesy of the repeated nature of the game but also due to the fact that it is playing against more than one ‘opponent’. Granted that more independence will stiffen the CB’s backbone in its dealings with politicians, what effect would it have on its overall capacity to impose its monetary policy?

In what follows I shall demonstrate that, if the CB is engaged in more than one interaction, it may actually value a little vagueness or ambiguity viz. its stance on inflation even if it is truly conservative. In short, an assessment of strong CB independence, which takes into account the CB’s overall aims, may reveal that its merits have been overstated. In fact, too much independence-from-government, as Mr Allan Greenspan was to discover to his detriment, weakens CBs vis-à-vis the private financial sector. Especially at a time when the latter is becoming increasingly detached from the rest of the domestic real economy.

A2.3 The Treasury versus Central Bank interaction

In this section I utilise a two-period model of the interaction between a government and its Central Bank (CB); a neoclassical model compatible with those in Muscatelli (1995, 1998a, 1998b). Its purpose is to act as a benchmark by which to re-assess the case in favour of strong CB independence after the introduction of our third player (the private sector banks).
This project has received funding from the European Union’s Seventh Framework Programme for research, technological development and demonstration under grant agreement no 266800

As is usual in this neoclassical literature, I shall assume that in the first period \(i=1\) a government’s maximand features as arguments inflation and deviations of output from some target - see (1) below. The constraints are the standard short-run Phillips curve [see (2)] and the assumption that wage-setting reflects rational expectations on prices [see (3)].

Government (G) maximises 

\[
\max_{\pi} -[(y - y')^2 + a\pi^2 + f]
\]  

(1)

where \(y, y', \pi, a\) and \(f\) are: real output, desired real output, inflation, the relative weight assigned to inflation by G and, lastly, exogenous political costs in case of conflict with the CB.

\[
y = \pi - E_{\tau=1}(\pi) + \varepsilon; \quad \varepsilon \sim N(0, \sigma^2_{\pi})
\]  

(2)

Subsequently wages are set with expected inflation in mind. The supply shock \(\varepsilon\) is unobserved by bargainers in the labour market during period \(i=1\) and thus,

\[
w = E_{\tau=1}(\pi)
\]  

(3)

During the second period \(i=2\), and after wages have been set according to (3), G observes the supply shock and maximises (1) subject to (2) and (3) while treating the public’s beliefs as parameters. The result is the optimal target for inflation in (4) below.
\[ \pi = \frac{y'}{\alpha} - \frac{\varepsilon}{1 + \alpha} \]  

(4)

Anticipating (4), the public set \( E_i(n) = \frac{y'}{\alpha} \) during \( i=1 \) (since at that time they could not have observed the supply shock). The result is that wages cannot be altered in proportion to the 'feedback policy' term, i.e. \( -\left[\varepsilon/(1+\alpha)\right] \), whose purpose is to absorb any supply shocks.\(^{13}\) The result is that the public entertains higher expected prices than it ought to [because of the presence of the inflation bias term \( \frac{y'}{\alpha} \)] which, in a never ending circle, feed into higher prices and limit \( G \)'s capacity for stabilisation.

The commitment problem arises because even if \( G \) were to announce \( n = -\left[\varepsilon/(1+\alpha)\right] \) as its target, the public would not believe the politicians [since it is in their interest to return to target \( n = \frac{y'}{\alpha} - \left[\varepsilon/(1+\alpha)\right] \) once wages have been set and the supply shock is observed]. CB independence and the appointment of an ultra-conservative banker (i.e. someone with a value of \( \alpha \) tending to infinity) are thus canvassed as one way in which \( G \) can commit to an inflation target free of the inflationary bias;\(^{14}\) i.e. to \( n = -\left[\varepsilon/(1+\alpha)\right] \). Another possibility is that \( G \) could announce \( n = -\left[\varepsilon/(1+\alpha)\right] \) as its target and appoint an independently minded CB Governor to achieve that target. As long as the CB administration cares supremely for its reputation as an achiever of pre-established targets, there is no difference.

Letting the appointed CB’s maximand be given by (5), all that \( G \) needs to do in order to ensure the credibility of its low-inflation policy is that it selects a CB with a very high \( \gamma \) and announce a target given by (6) at the time of CB’s appointment.

\[ -(\gamma(n-n^*)^2 - \psi H) \]  

(5)

\[ n^* = -\left[\varepsilon/(1+\alpha)\right] \]  

(6)
[where $\psi$ is the cost of conflict with the government and $H_t$ is a dummy which becomes equal to 1 when such conflict occurs while remaining at zero otherwise].

In the context of optimal contracts (i.e. contracts according to which G punishes the CB proportionately to the deviation of actual inflation from $\nu'$), McCallum (1995) asked: Why would G want to punish the CB if the latter’s failures endow the former with a welcome capacity to affect output? In this model this question is less pertinent since the CB Governor is punished automatically by the loss of reputation [see equation (5)]. Nevertheless the question remains: What is to stop a G with a keen interest in altering the inflation target midstream from trying to ‘lean on’ the CB? For example suppose that G’s relative valuation of low inflation [ie. $\alpha$] is a function of time (and of political developments). Goodhart (1994) has suggested that the public’s ‘taste’ for inflation is serially correlated in a manner that forces governments to re-adjust [in response to the median voter’s changing mood] their targets. Thus in the second period (i=2), G’s relative valuation of inflation may be given by:

$$\alpha_i = A + g_2 ; \text{ where } A \text{ is a constant and } g_2 = \xi g_1 + \nu_2 ; \text{ where } \nu_2 \sim N(0, \sigma_v^2) \tag{7}$$

i.e. the second period sees not only the realisation of supply shock ($\varepsilon$) but also of the change in the median voter’s view of the cost of inflation. The latter ($\alpha_i$) is given by a constant term plus a variable term which depends on the previous period’s valuation as well as a random disturbance. To see why the variability of the public (or political) mood viz. inflation may throw a spanner in the credibility mechanism, suppose that at i=2 the observed supply shock and random change in the public’s valuation of inflation are given by $\varepsilon = \varepsilon' < 0$ and $\nu_2 = \nu' < 0$. G’s preferred inflation target at that point would be

$$\pi^* = \frac{y'}{A + \xi g_1 + \nu'} - \frac{\varepsilon'}{1 + A + \xi g_1 + \nu'} \tag{8}$$
We find that the greater the absolute value of the negative $v'$ (i.e. the less the public concern about inflation at a time of low aggregate demand), the greater G’s incentive to coerce CB to raise its inflation target above the level given by (6) and towards that given by (8). And there lies the rub: if the public anticipates that G can do this, then inflationary expectations will rise again and the commitment mechanism will have failed. Thus the credibility of G’s announced monetary policy at $i=1$ depends on the degree of actual independence of the CB, rather than any nominal independence that it may have been granted. In the final analysis, the commitment mechanism will depend on the public’s perception concerning G’s capacity to influence CB.\(^{17}\)

As the experience of developing countries with independent CBs shows, actual independence springs from the G’s inability to inflict decisive costs on the CB when the latter does not yield to pressure. Moreover there is little doubt that, whatever the legal framework governing the CB’s operation, G can always exact such punishment. The question is: Is the punishment a G can mete out sufficient to alter the CB’s policies? Suppose G can inflict a penalty on the CB’s Governor (when the latter refuses to amend the inflation target from $\pi^*$ to $\pi^{**}$) given by:

$$\psi = \delta(\pi^{**} - \pi^*)^2$$  \hspace{1cm} (9)\(^{18}\)

Substituting (9) into (5), it transpires that the CB will not succumb to pressure (to increase its inflation target) as long as $\gamma > \delta$ - that is, as long as it cares more for its reputation for meeting the pre-announced target than for the penalties inflicted on it by G. We shall refer to the CB as actually independent if $\gamma > \delta$ and vulnerable otherwise.

The game’s second period ($i=2$) can be modelled as follows: A ‘move’ by G corresponds to an attempt to coerce CB to upgrade the inflation target (for well-rehearsed reasons) from $\pi^*$ to
40

Alternatively G ‘stays’ (i.e. it lets the CB continue with its original monetary policy). In that case, CB’s payoff is $-\gamma(n-n')^2$ [see (5)] whereas G’s payoff is given by $\{-\gamma+\gamma'\}^{2-an^2}$ [see (1)]. We normalise these payoffs to equal $h(>0)$ and 0 respectively. If on the other hand G ‘moves’ against CB, the latter can either ‘give in’ or ‘resist’; where the strategy of resistance would involve a monetary contraction in order to signal CB’s determination to stick to target $n^*$. As we have already seen in the last paragraph, CB will acquiesce if vulnerable; that is, if the cost of resisting G’s ‘move’ exceeds that of losing its reputation for achieving pre-announced inflation targets; i.e. if $\gamma>\delta$. We normalise CB’s payoffs to equal -1 if it ‘resists’ in this case and 0 if it does not. In the opposite case (i.e. when its payoff is higher from ‘resisting’ than from ‘giving in’) the normalised payoffs are reversed: an independent CB receives -1 if it acquiesces and 0 otherwise).

Looking at this situation from G’s perspective, a challenge comes at a political or institutional cost equalling $f(>0)$ in equation (1). The worst outcome for G is a ‘resisted’ challenge which will incur penalty $f$ without altering the inflation target in the direction which the median voter would have appreciated. We normalise that payoff at -1. On the other hand, a successful ‘move’ (i.e. a move that is not ‘resisted’ by the CB) will yield G’s most-favoured outcome (assuming the adoption of the new target in (8) adds more utils in (1) than the cost of the challenge $f$). I normalise that payoff at $d(>0)$.

Will G make a move against CB’s autonomy? It will, provided $p=Pr(\gamma>\delta)$ does not exceed some threshold. To be precise, G will ‘move’ as long as

$$p < d/(1+d)$$  \hspace{1cm} (10)

In summary, the fortunes of inflation targets free of inflation-bias [i.e. equation (6)] improve the higher the CB’s reputation for independence. Proponents of strong CB independence
argue that the safest way of maintaining the CB’s reputation $p$ above the critical threshold in (10) is to appoint a conservative untouchable as Governor of a totally autonomous institution. Setting aside all other arguments against this utterly unrealistic conclusion, to which the neoclassical literature was wedded in the 1980s, 1990s and beyond, I show below that, if we are to take into account other concerns that a CB might have, *maximising* the value of reputation $p$ may not be such a good idea.

A2.4 The Central Bank’s other game

In this section I introduce the missing interaction: an $m$-period contest between the CB and the private sector banks (PSB hereafter) over control *vis-a-vis* the timing of interest rate changes and, potentially, of the effective money supply (which, after 1980s, ought to include financial instruments).

Throughout the 1970s and 1980s, especially in the United States, Britain and northern Europe, it was evident that the term structure of interbank rates had become extremely sensitive to interest rate expectations (see Hurn, Moody and Muscatelli, 1995). Mindful of this sensitivity, and in order to maintain stability, the CB often sought to discourage piecemeal or unpredictable base rate changes by manipulating very short-term rates in response to changes in anticipated future rates. Indeed, the Fed was particularly mindful of the importance of this manipulation ever since Paul Volcker took the reins.

However in order to be effective in this regard, a CB must develop the right reputation via appropriate strategic choices. Sticking as closely as possible to the type of neoclassical monetary analysis popular in the 1980s and 1990s, I shall assume that the CB’s instrument was the 7-day rate $(r)$ and its target (in each period $i$) was to reduce the variance of the m-
period (e.g. 3-month) interbank rate \( [R^m] \) which is determined by current and expected values of the 7-day rate:

\[
R_i^m = \frac{r_i + E_i \left( \sum_{j=1}^{m-1} r_{ij} \right)}{m}
\]

(11)

where \( E(.) \) denotes the expectations of the PSB.\(^{19}\)

If at \( i=0 \) the market forecasts a new rate equal to \( \beta \), the PSB would be keen to adjust their rates by setting \( R= \beta \) at \( i=1 \). If the CB wished to retain full control of the timing of that change, it could respond at \( i=2 \) with a change of \( r \) in the opposite direction signalling its commitment to determine the exact moment when \( R \) is allowed to equal \( \beta \). Let us denote this ‘resistance’ rate by \( r^* \). Of course this act of ‘resistance’ by CB will not bear fruit if the difference (in absolute terms) between \( r^* \) and \( R^m \) were to exceed some threshold level \( \Omega \). Thus inequality (12) must hold if the introduction of a resistance 7-day rate is to succeed in maintaining CB’s hold on the timing of rate changes.

\[
r^*_2 + E_2 \left( \sum_{j=2}^{m-1} r^*_{ij} \right) \leq \Omega_m
\]

(12)

One obvious way in which the CB could deter unauthorised changes in \( R \) was to commit to responding to such changes by setting \( r_i = r^*_2 \) \( \forall i=1,\ldots,n \) and \( r_m = \beta \) where \( n(<m) \) is chosen at random. For example, suppose that PSB were to make its ‘move’. Then the CB might well attempt to ensure that \( R= \beta \) at \( i=1 \) by:

(A) setting 7-day rates equal to \( r^*_2 \), and then

(B) setting 7-day rates equal to \( \beta \) with probability \( (1-\lambda) \) in each of the following periods.
In this case (13) captures the PSB’s expectations concerning the CB’s actions in the periods beyond \( i=1 \) as formed at the beginning of \( i=1 \).

\[
\begin{align*}
\Pr[\Delta r_{i+j} = \beta] &= (1-\lambda)\lambda^i; \\
\Pr[r_{i+j} = \beta] &= 1-\lambda r^i; \\
\Pr[r_{i+j} = r^i] &= \lambda r^i; \\
\Pr[\Delta r_{i+j} = \beta] &= (1-\lambda)\lambda^i \forall i \in [1,m]
\end{align*}
\]

(13)

In brief, everyone knows that the CB will push rates to \( \beta \), even though it resisted that rate at \( i=1 \) (i.e. \( \lim_{t \to i} \{\Delta r_{i+j} = \beta\} = 1 \)), although no one knows when that rate will be enacted. PSB are thus kept guessing by means of a randomising strategy which forces them to expect, at the beginning of period \( i=1 \), the very-short term rate \( r \) to equal:

\[ E_i[r_i] = r^*_2 \lambda^i + \beta(1-\lambda^i) \]

(14)

Assuming that the CB wishes to intervene as little as possible (i.e. to minimise the difference between \( r^*_2 \) and \( \beta \)), I treat (12) as an equality and substitute into (14). Solving for \( r^*_2 \) we get:

\[ r^*_2 \left( 1 + \sum_{j=1}^{m-1} \lambda^j \right) + \beta \sum_{j=1}^{m-1} (1-\lambda^j) = \Omega_m \Rightarrow r_2^* = \beta - m(\beta - \Omega) \frac{1-\lambda}{1-\lambda^m} \]

(15)

Expression (15) yields the CB’s ‘resistance’ rate; that is, the 7-day interest rate that the CB must impose at \( i=2 \) in order to force PSB to back down from un-prompted rate changes.

The question now becomes: Can the CB commit credibly to such tough action? On the one hand the monetary authority has an interest in retaining a reputation for tight control over effective base rates. On the other, reducing interest rates and holding off increases for days or weeks on end (or vice versa) against the grain of market expectations comes at a cost (not
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least in jeopardising its anti-inflation or exchange rate policies]. The answer to the question depends on the CB’s priorities. Put simply, it is as if the CB’s objective function in this interaction with the PSB is of the form:

$$\sum_{j=1}^{m-1} (\zeta D_j - kH_2)$$

(16)

where \(D_j\) is a dummy taking the value 1 whenever \(r_j = \beta (j=1,...,m)\), \(k\) is the per period (eg. daily) cost of resisting the PSB’s ‘move’ to raise medium (3-month) rates to \(\beta\) at \(i=1\), \(H_2\) is a dummy taking the value of 1 when such resistance occurs, and \(\zeta\) is a positive parameter capturing the CB’s utility from retaining control over timing (per period). Thus with every period of effective resistance (following an autonomous increase of 3-month rates by PSB at the beginning of period \(i=1\)), the CB receives \(\zeta\) utils from having imposed its timing on the market but at a cost of \(k\) utils. In this sense, following a ‘move’ by PSB, acquiescence leaves CB with payoff 0 whereas resistance yields expected payoff \([1-\lambda^{i-1}](\zeta-k)\) (since the expected length of resistance given the CB’s randomising rule (see equation 13) is \(1-\lambda^{i-1}\)).
Thus either $\zeta > k$ and the CB will 'fight' against unauthorised alterations by the PSB, or $\zeta < k$ in which case the CB chooses not to respond to unauthorised PSB changes in 3-month rates. In the former case we shall label the CB *inflexible* while in the latter case *passive*. Letting the probability that CB is *inflexible* (as assessed by PSB at $i = 1$) equal $s$, it turns out that PSB will dare alter the 3-month rate *without waiting for the CB to give the green light* only if $s$ does not exceed a certain threshold. The latter is quite easy to compute once the CB vs PSB game is formulated as follows:

I let CB’s and PSB’s payoffs equal $a(>0)$ and 0 respectively in the case in which the PSB abstains from attempting to determine the timing of interest rate changes (ie. PSB ‘stays’). If now PSB ‘moves’, its worst payoff materialises if the CB ‘resists’ (since changing rates twice in a short space of time translates not only into administrative costs but into a marketing nightmare as well). By contrast the best payoff for the PSB results from the CB ‘giving in’ and thus an interest rate that reflects market expectations more accurately. These payoffs are normalised at $b(>0)$ and $-1$ corresponding to outcomes ‘PSB moves and CB gives in’ and ‘PSB moves and CB resists’ respectively. Finally the CB’s payoffs following a ‘move’ by the PSB depends on its priorities viz. timing. If its type is of an *inflexible* type ($\zeta > k$), the CB’s payoff from resisting will exceed that from giving in. And vice versa. Bearing in mind that the CB’s most preferred outcome is that the PSB do not ‘move’ in the first place, I normalise its payoffs from ‘resisting’ and ‘giving in’ at $[0,-1]$ and $[-1,0]$ depending on whether it is *inflexible* or *passive*.

The following section links the two games played by the Central Bank (the one in the previous section against the government with this game against commercial banks).
A2.5 Reputational trade-off and Central Bank Independence

If the CB’s reputation as a defender of its inflation target from G’s interference were independent of its reputation for eagerness to control its monetary policy’s transmission mechanism in the realm of the grossly financialised financial sector, and to determine the timing and magnitude of interest rate changes as they pertain to firms and households, there would be little more to say about a CB’s aims: An overall reputation for toughness would be highly prized. However the two reputations are likely to be inter-dependent since the subjective cost to the CB from delaying the adjustment of actual interest rates in line with market expectations (in Game 2) is most likely related to the weight the CB attaches to its inflation target (in Game 1). The higher the CB’s aversion to missing its inflation target (i.e. \( \gamma \)) the greater its disutility from having delayed an inevitable interest rate change for one sub-period (i.e. \( k \)).

The result of this link is a trade-off\(^{20}\) between the CB’s two reputations \( p = Pr(\gamma > \delta) \) and \( s = Pr(\xi > k) \): CBs which are known as independent of governments (viz. inflation targets) will also be those which the private sector expects to be less inflexible regarding their response to unauthorised (by CB) interest rate adjustments to market expectations. And vice versa. In other words, a CB or Fed that is impervious to Treasury or Congress pressures is one that may be more easily bent to the will of the financial sector – and especially the shadow banking sector which plays such a crucial yet under-recorded, role in liquidity generation and even interest rate transmission.

In order to explore this thought, I assume, for simplicity,\(^{21}\) that \( p = 1 - s \). This link of the two games (assuming they are played simultaneously) generates two possible cases. The first (Case 1 below) predictably has either one or both of the CB’s adversaries (i.e. G and/or PSB) make a ‘move’. In the second case (Case 2 below) the CB is safe from simultaneous moves by
the G and the PSBs. Indeed it is even possible that the CB will enjoy full and uncontested control over monetary policy in both arenas provided the CB’s reputation for independence from G in Game 1 (or equivalently its inflexibility or passivity in Game 2) is not totally beyond doubt. In short, in Case 2 an ambiguous reputation, i.e. a value of p neither too high nor too low, is of great value to the CB as it bestows upon it freedom from interference from governments as well as from commercial banks. In contradistinction, in Case 1 ambiguity can only spell a twin challenge.

\[
\begin{array}{c|c|c|c|c}
\text{move by PSB} & \text{move by PSB and G} & \text{move by G} \\
\hline
\text{Case 1: } b > (1/d) & \frac{p_{PSB}}{1/(1+b)} & \frac{p_G}{d(1+d)} & 1 \\
\text{Case 2: } b < (1/d) & 0 & \frac{p_{PSB}}{d(1+d)} & \frac{p_{PSB}}{1/(1+b)} & 1 \\
\end{array}
\]

Let \( \mathcal{H} = \begin{cases} [p_{PSB}^G, p_G] & \text{when } bd > 1 \\ \emptyset & \text{otherwise} \end{cases} \) and \( \Psi = \begin{cases} [p_G, p_{PSB}^G] & \text{when } bd < 1 \\ \emptyset & \text{otherwise} \end{cases} \)
Note that there are two cases. In Case 1 \((bd>1)\) the CB dreads a middle-of-the-road reputation for independence \(p\), i.e. \(p \in \Pi\) because it would trigger ‘moves’ against its authority from both G and the PSB. We label the set of reputations \(\Pi\) the danger zone. When it is non-empty (i.e. \(bd>1\)), and provided the CB would rather it maintained unchallenged control over inflation rather than over the timing of interest rate changes (i.e. \(h>a\)), the CB will prefer a reputation for strong independence. However in Case 2 \((bd<1)\) set \(\Pi\) is empty while there exists a range of middle-of-the-road reputations, set \(\Psi\), such that neither the G nor the PSB would dare ‘move’. I call set \(\Psi\) the safety zone since any reputation within it would render the CB immune from both types of ‘moves’. In that case an ambiguous reputation for independence allows the CB to reap maximum payoffs in both games. Remarkably this is so even though politicians and commercial banks are perfectly aware of the impossibility that the CB would want to meet challenges from both. Nevertheless neither of them thinks it worthwhile to test the true preferences of the CB.

Whether the CB will face a reputational safety zone or not will depend on the relative eagerness of G and PSB to wrestle control from the CB (the first viz. inflation and the second viz. the timing of interest rate changes). If, for example, G were to gain more or less the same payoff as PSB from uncontested ‘moves’ against the CB (where these payoffs are measured in relation to the payoff from not challenging the CB at all) and that payoff (for both PSB and G) was less (in absolute value) than the cost of conflict with the CB (i.e. \(db<1\)), then the CB would wish it had a reputation for independence from a government’s designs over its inflation target (i.e. \(p\)) which is neither too large nor too small (i.e. \(p \in \Psi\)).

The same applies when one of the two potential challengers (G or PSB) have a great deal to gain from an unopposed ‘move’ compared to the potential gains of the other. Suppose G’s gains from challenging an acquiescent CB exceeds (in absolute value) its potential (political) loss from a fight with the CB (i.e. \(d>1\)). Then again the CB’s autonomy will be shielded by an
ambiguous reputation provided the PSB has less to gain (in absolute terms) from a successful bid to alter interest rates without the approval of the CB than a fraction $1/b$ of its potential losses from a fight with the CB over this issue. Similarly, an ambiguous reputation within $\Psi$ might prove beneficial for the CB if (i) $G$’s gain from an uncontested ‘move’ against the CB’s inflation target exceeds the magnitude of its potential losses from a fight on this matter, and (ii) the PSB’s potential benefit from an uncontested ‘move’ is less than the magnitude of their potential loss from a failed attempt to control the timing of interest rate changes times a factor equal to $1/d(>1)$.

However if the product of the potential gains of $G$ and PSB exceed the product of their potential losses due to CB resistance (in absolute values), then an ambiguous reputation will land the CB in the danger zone $\Pi$, which represents its worst-case scenario. In summary, some doubt about its genuine independence from government (ie. $p \in \Psi$) may serve the CB’s overall monetary policy [both its inflation target as set in equation (5) and its control over when interest rates ought to be altered] better than an unequivocal reputation for independence or inflexibility provided one of the following three sets of circumstances hold: First, the PSB and $G$ gain more or less equally from uncontested ‘moves’ against the CB but neither gains (in absolute terms) more than what they would lose were the CB to resist. Second (third), when $G$ (PSB) has a great deal to gain but the PSB’s (G’s) gains from altering interest rates (the inflation target) are modest compared to the losses from a stand-off with the CB. If none of these circumstances hold the CB will prefer that its preferences are perfectly known so as to avoid one of two ‘moves’.

$A2.6$ Long run effects

So far the CB has been strategically passive. It has a given reputation which leads to certain payoffs in each game. In order to explore the manner in which the CB could tune its behaviour
in order to manipulate its reputation profitably, we may assume that the game is finitely repeated. What distinguishes this repeated game from other such studies (see Backus and Driffill, 1985) is the prospect of interesting insights due to the linkage of the CB’s reputation across different interactions.

Suppose the super-game is expected to last $T$ periods in each of which CB’s composite reputation is given by $p_t$, $t=1,2,...,T$ (where $T$ can be thought of as the CB’s term in office). The immediate effect of repetition is that the probability that the CB will resist a ‘move’ by G [or PSB] might exceed $p_t$ (or be less than $1-p_t$) for the simple reason that, if the benefits to the CB from deterring such ‘moves’ by G [or PSB] is large enough [ie. for large $h$ (or $a$)], then in the early stages the CB might fight ‘moves’ by G [or PSB] that it would have not contested in the one-shot version. As long as $1>p_t>0$, there is scope for such reputation-building [a la Kreps and Wilson, 1982].

Let $1-\chi_t$ be the probability that, at time $t$, the CB will bluff in its interaction with G; ie. it will fight a G- ‘move’ so as to protect its inflation target even though its one-shot cost from a fight exceeds its cost of acquiescence [that is, even though $\gamma<\delta$ and thus CB is vulnerable to G]. Similarly let $1-\varphi_t$ be the probability that, at time $t$, the CB will bluff in its interaction with the PSB; ie. it will not acquiesce to unauthorised alterations of interest rates even though it is passive in Game 2 [that is, $\varsigma<k$]. In view of the scope for bluffing, the CB’s danger and the safety zones become $\Pi=(p_t^{PSB},p_t^{G})$ and $\Psi=(p_t^{G},p_t^{PSB})$ respectively where

$$p_t^{G} = \frac{\chi_t(1+d)-1}{1+d} \quad (17) \quad p_t^{PSB} = \frac{1}{\phi_t(1+b)} \quad (18)$$

Finally, in view of the effects of repetition on the values of $p_t^{PSB}$ and $p_t^{G}$, it is crucial to examine in which range, or zone, the reputation of the CB falls at the beginning of each round. If for
instance, $p \in \mathcal{N}$, the CB’s reputation will lie in the danger zone and is bound to face a double ‘move’. Conversely if its reputation falls within the safety zone (i.e. $p \in \mathcal{S}$), the CB will be insusceptible (during round t) to either challenge. Evidently the rational CB will try, through suitable behaviour in the earlier rounds, to maximise its reputation’s safety zone while minimising the danger zone. Let us now revisit the two cases discovered in the previous section:

**Case 1** $bd > 1$.

Recall that this is the case in which either PSB or G (or indeed both) have a great deal to gain from uncontested ‘moves’ against the CB’s control over monetary policy (in relation to their potential losses if the CB engages them into a ‘fight’). In the last play of the game ($t=T$), aware that it cannot avoid at least one ‘move’ against it, the CB will be keen to avert a double ‘move’; i.e. it will wish that its reputation stays out of the danger zone ($p^* \in \mathcal{N}$). However in earlier rounds, CB’s scope for averting ‘moves’ by its adversaries is significant. Indeed at $t<T$ the prospect of reputation-building by the CB translates into a positive probability of bluffing [i.e. $x_t, \phi_t < 1$] and thus causes the danger zone $\mathcal{N}$ to shrink or even to disappear.

For example, suppose that $b=d=2$ and the game is to be repeated 4 times. In the fourth and final round, $\mathcal{N} = [1/3, 2/3]$. However in a previous round (e.g. $t=3$), if there is a one-in-four chance that the CB will bluff [i.e. it will fight G even though it is not independent with probability $1-x_t = 1/4$; or that it will resist the PSBs even though it is, in reality, passive with probability $1-\phi_t = 1/4$], the danger zone $\mathcal{N}$ shrinks to $[4/9, 5/9]$. Moreover were G and PSB to fear an even chance of a bluff in each game (i.e. $x_t=\phi_t=1/2$), the danger zone $\mathcal{N}$ would vanish completely and would give its place to a generous safety zone $\mathcal{P} = [1/3, 2/3]$. 


Additionally to the prospect of remaining interference-free for quite a few of the earlier rounds, the CB can look forward to another benefit in this case: If its desire to deter government interference is significantly more pressing than its eagerness to deter unauthorised moves on interest rates (more precisely, if \( h-2>a \)), the government will never dare ‘move’ at \( T-1 \) however \textit{vulnerable} to its ‘moves’ the CB may be known to be (that is, however low the value of \( p_{T-1} \) within the danger zone \( \Pi_{T-1} \)). The reason is that during the penultimate round, if both PSB and G have ‘moved’, the CB will rather acquiesce to PSB and resist G even if both come at a short term cost of -2. If such behaviour were to help it become identified as \textit{independent} in Game 1 (and thus \textit{passive} in Game 2), the CB stands to collect payoff \( h \) in the final round \( T \). Knowing this, G will not dare give CB the opportunity to act in this manner at \( T-1 \) and will therefore avoid a ‘move’ at \( T-1 \). In general as long as \( p_t \in \Pi_t\) and \( h+T-t > a > h-T+t \), there will be no ‘move’ in round \( t \) by the challenger whose deterrence the CB desires most strongly.

In summary, repetition makes it possible for the CB to turn the tables on potential challengers to its authority over monetary policy. What it requires is a credible (commonly known) probability of bluffing which will not only deter simultaneous ‘moves’ by G and PSB but will also generate a range of reputations such that neither of its adversaries dare move until the last round of the game. More precisely, there exists a value of \( \chi_t = \chi \) s.t. when \( \chi_t \) falls below \( \chi \), at least one of the two (and perhaps both) challengers will be deterred\(^{25} \). The problem facing CB is how to engender that precise subjective probabilistic belief in the minds of its adversaries. I shall return to this issue in the next section.

\textbf{Case 2} \( bd < 1 \cdot p_T^G < p_T^{PSB} ; \Pi_T = \emptyset ; \Psi_T = [p_T^G , p_T^{PSB}] \)

From the previous section’s analysis we know that this is the case in which, if there is no further repetition (e.g. \( t = 7 \)), the CB will either face a single ‘move’ or none at all. The reason is
that the product of the potential gains of G and PSB from causing CB to acquiesce (ie. $bd$) is less (in absolute value) than the cost of conflict with the CB to each of them. In that case the CB will be shielded from any ‘move’ during the last round provided $p_T \in \Pi_T$. By backward induction it transpires that as long as $p_T \in \Pi_T$, the CB will be spared both types of ‘moves’ throughout the supergame. But this is not all. Because in the earlier rounds of the game the CB will have an interest in cultivating such an ambiguous reputation, G and PSB will expect it to resist ‘moves’ in either game with positive probability even if $p_t$ falls outside $\Pi_t$.

For example, let $d=b=\frac{1}{2}$. The safety zone at $t=T$ is given by $\Psi_t=[1/3,2/3]$. However if at $t=T-1$ $x_{T-1}=\frac{3}{4}$ [that is, if at time $T-1$ there is a one-in-four chance that the CB will bluff against either challenger, aiming for a reputation in the safety zone], the safety zone expands to $\Psi_{T-1}=[1/9,2/9]$. Thus in the earlier rounds it is even more likely that the CB will be free of interference from either G or PSB. The only thing that can overturn this desirable situation is for the CB to have too high an initial reputation in one of the two arenas. It is in this sense that institutionalised independence from politicians may be less desirable than had been conventionally assumed from the end of Bretton Woods to the Crash of 2008.

A2.7 Reputation building in equilibrium

In equilibrium, there exist four possible ways in which the observation of a ‘fighting’ CB alters its reputation.

(i) $h<a$ and, at $t<T$, CB fights a ‘move’ by G. Then $p_{t+1}=0$

(ii) $h>a$ and, at $t<T$, CB fights a ‘move’ by PSB. Then $p_{t+1}=1$

(iii) $h>a$ and, at $t<T$, CB fights a ‘move’ by G. Then

$$p_{t+1} = \frac{p_t}{p_t + (1-p_t)(1-x_t)} \quad (21)^{26}$$
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Moreover, in equilibrium the mixed strategies regarding the chance of acquiescing to some 'move' by G of a vulnerable CB, as opposed to feigning independence, is given by \((23a)\) below. Similarly the equilibrium mixed strategy of a CB passive to PSB unauthorised moves is given by \((23b)\). Substituting \((23a)\) into \((21)\) and \((23b)\) into \((22)\), we derive in \((24a)\) and \((24b)\) respectively the sequential equilibrium time path of the CB’s reputation.

\[
\phi^*_i = \frac{1}{p_i (1 + b)} \quad (23b)
\]

\[
p^G_t = \left[ \frac{d}{(1 + d)} \right]^{T-t} \quad (24a)
\]

\[
p^\text{PSB}_t = \left\{ \frac{b^{T-1}}{(1 + b)^T} + \sum_{i=1}^{T-1} \left[ \frac{b^{2-i}}{(1 + b)^{T-i}} \right] \left[ \frac{1 + b}{b} \right]^{T-i} \right\} - \sum_{i=1}^{T-1} \left[ \frac{(1 + b)^{T-i-1}}{b^{T-i}} \right] \quad (24b)
\]

Briefly I find that, as foreshadowed in the previous section, in equilibrium the two cases unearthed in Section A2.3 are brought closer together as a result of repetition and Bayesian learning. Let me begin with Case 2. Repetition expands the CB’s safety zone in earlier rounds considerably. For example, suppose that \(d=b=\frac{1}{2}\) and \(T=4\). According to equation \((24)\) the CB’s safety zone is \([1/3, 2/3]\) in round 4, \([1/9, 8/9]\) in round 3, \([1/27, 26/27]\) in round 2 and an incredible \([1/81, 1]\) in the first round. In other words, when there are another 3 rounds ahead, only next-to-complete certainty (ie. \(p<1/81\)) that the CB’s independence is a sham will cause the G to ‘move’. As for the PSBs, there is no way they would ever ‘move’ at \(t=1\). Even when there is only a single round to play (ie. at \(t=3\)) a low probability of one-in-nine that the CB is independent...
(and an equal probability that CB is *inflexible*) are sufficient to scare both G and PSB off. Summarising, in Case 2 even a small amount of ambiguity about the preferences of the CB ensures that its true character is never tested as long as there is a future to play for. Indeed the CB’s worst enemy, in this case, is absolute clarity about its real disposition (ie. \( p=1 \) or \( p=0 \)).

Surprisingly a similar conclusion may indeed apply in Case 1. As indicated in the previous section, the *danger zone* \( \Pi_t \) in the last round of the game may either shrink inordinately in earlier rounds or even disappear altogether giving rise to a *safety zone* \( \Psi_t \) for \( t<T \) (that is, as in Case 2). Using the equilibrium time paths in (24), we find that even one repetition may do the trick. For example, suppose \( d=b=2 \) and \( T=4 \). In the last round \( (t=4) \), the CB faces a *danger zone* \( [1/3,2/3] \); that is, if \( p_t \) lies between one-third and two-thirds, both G and PSB will be encouraged to ‘move’. However at \( t=3 \) that *danger zone* disappears (ie. \( \Pi_t=\emptyset \)) and in its stead the CB faces the pleasant prospect of a slender *safety zone* \( \Psi_3=[4/9,5/9] \). In the first two rounds \( (t=1,2) \) the *safety zone* expands: \( \Psi_2=[8/27,19/27] \) whereas \( \Psi_1 \) is a sizeable \( [16/81,65/81] \).

To get a feel for the CB’s opportunities created by the linkage between the two games, suppose that at the outset its opponents have no idea concerning its ‘character’. They thus set \( p=1/2 \). Since this reputation is well within \( \Psi_t \) for \( t=1,2,3 \) neither PSB nor G will ‘move’ until \( t=4 \) at which point they will ‘move’ simultaneously prompting the CB to fight G if *independent* or PSB if *inflexible*. Thus the CB’s overall payoffs will equal \( 3(a+h) \). Let us now compare this outcome with what would have happened had CB had an unshakeable reputation for *independence*. With \( p=1 \) a truly *independent* CB would collect \( 4h \) from Game 1 (and nothing from Game 2). On the other hand a *vulnerable* CB with such a solid reputation for *independence* (viz. its inflation target) could choose to keep that reputation by allowing (at a cost of -1 per round) the PSB to alter interest rates at will. Overall its payoff from the first 3 rounds will equal \( 4h-3 \), since at \( t=4 \) it will repudiate the PSB not caring about the fact that to G
will realise that all this time it was only feigning independence. Alternatively CB could fight PSB at $t=1$ in which case (and given that $p_1=1$) $p_2$ would collapse to 0 deterring the PSB from all subsequent ‘moves’ and giving the green light to G (as of $t=2$). Under this scenario CB’s payoffs equal $3a$. Thus as long as $h>0.75(1+a)$ the CB will behave up until $t=4$ as if it were independent. Only in the last round will it reveal its true preferences.

So we find that, under very broad conditions, CB’s payoffs are maximised (and so is its monetary policy’s overall autonomy) by an ambiguous reputation around $p_1=1/2$ rather than by a clear image as an institution impervious to government interference. In the above example this would not be so only in the extreme case $h<3(a+1)$. In conclusion, the assumption of sequential equilibrium beliefs leads to the insight that regardless of CB’s underlying disposition, or indeed that of its adversaries (ie. irrespectively of whether Case 1 or 2 applies), an ambiguous reputation is likely to work in CB’s favour and to shield its monetary policies from hostile moves by the government or the private sector banks.

A2.8 Some effects of out-of-equilibrium beliefs

There is of course no mechanism in the above analysis which guarantees that rational governments and banks will converge onto equilibrium mixed strategies. Moreover, it is well known that consistently aligned beliefs are structurally inconsistent (see Kreps and Ramey, 1987). The result is that out-of-equilibrium beliefs must be given some thought if the analysis is to approach a desirable degree of realism. Naturally there is a plethora of beliefs about beliefs off-the-equilibrium path. This is a standard weakness of all neoclassical models. However it is still of interest to explore some possibilities under the assumption that the CB expects others to base their expectations about its actions (and beliefs) on a convex combination of expectations of non-equilibrium behaviour. Consider the following example:
Let $T=5$, $d=5$, $b=2$, $h=10$, $a=1$, $p=0.6$ while CB is vulnerable to G 'moves' against its inflation target [i.e. $\gamma<\delta$]. According to the equilibrium scenario during the first three periods the CB will be immune to both government interference and unauthorized moves on medium term interest rate by the PSB$^{28}$. However as the end of the CB’s term approaches its position will become shakier. At $t=4$ in particular the safety zone ($\Psi$) will disappear giving its place to a danger zone $\Pi=[0.55,0.695]$ within which the hitherto untested reputation of the CB falls. Thus at $t=4$ both G and PSB will make 'moves'. In equilibrium, the CB’s true nature ought to be revealed at that moment: Given that resisting both cannot drive its reputation into a safety zone in the next period [i.e. since $\Psi$ is the empty set and $\Pi=[0.33,0.834]$], no consistently aligned beliefs can support any course of action by the CB at $t=4$ other than acquiescing against G [since we assumed CB to be vulnerable to 'moves' by G].

Therefore after three periods of non-interference and unchallenged control of interest rates, the CB will be challenged on both counts at $t=4$. In equilibrium it will then acquiesce to G during $t=4$ and $t=5$ but still resist any unauthorised interest rate moves by PSB. Having noted that its initially ambiguous reputation [eg. $p=0.6$] has boosted the CB’s payoffs significantly [ie. by about 10%] [compared to a situation where it had a perfect reputation viz. the government at $t=1$], it is interesting to explore the possibility that the CB might be tempted to wreak further confusion amongst its challengers at $t=4$. For example, what if it were to resist both G and PSB at $t=4$?

What would G and PSB make of such puzzling [out-of-equilibrium] behaviour? One possibility is that they will consider their original understanding of the situation to have been false; that is, they may suddenly think that CB might be motivated differently and is perhaps willing to resist all-comers even at the last repetition of the game. For instance, government officials may start fearing that CB’s President or Governor may have developed a taste [perhaps an irrational one] for autonomy which she/he is prepared to back up with equivalently belligerent
behaviour. Or it could be that G and PSB overestimated the reputational trade-off facing the CB in its two contests. The second possibility is that they will see the CB’s out-of-equilibrium behaviour as a bluff whose purpose is to confuse them and thus deter them at \( t=5 \) by stirring up more uncertainty.

Let \( q_G \) be G’s subjective probability belief (having observed CB’s out-of-equilibrium behaviour at \( t=4 \)) that CB will resist all ‘moves’ at \( t=5 \) (either because CB is acting irrationally or because the reputational linkage was exaggerated at the outset - see footnote 24). Clearly as long as \( q_G>0.58 \) the CB’s puzzling decision to resist both G and PSB at \( t=4 \) will have succeeded at deterring G from ‘moving’ again at \( t=5 \). Similarly the PSB will also be deterred at \( t=5 \) as long as the observation of CB’s ‘deviant’ behaviour at \( t=4 \) led it to question its own perception of the situation sufficiently to expect another ‘deviation’ by CB at \( t=5 \) with probability \( q_{PSB}>0.25 \).

The question then is: Does it make sense for a rational CB to ‘deviate’ intentionally from the equilibrium path? On the one hand, if a deviation at \( t=4 \) deters G and PSB (i.e. gives rise to probability beliefs \( q_G>0.58 \) and \( q_{PSB}>0.25 \)) then it is worth it. On the other hand though, CB will be worried that G and PSB will dismiss its deviation for what it is: a blatant attempt to sow doubt in its opponents’ minds. If this is what happens, they would treat the deviation at \( t=4 \) as a random tremble containing no useful information and would, thus, ‘move’ again at \( t=5 \). In this eventuality, the CB will regret its deviance at \( t=4 \).

Let \( q'_CB=Pr_{CB}(q_G>0.58) \) and \( q'_{PSB}=Pr_{CB}(q_{PSB}>0.25) \) be the CB’s expectations that deviant (or out-of-equilibrium) belligerence at \( t=4 \) will be successful at engendering the necessary doubt in the minds of G and the PSB respectively so as to deter them from ‘moving’ at \( t=5 \). The CB will then rationally deviate at \( t=4 \) provided \( q'_CB=q'_{PSB}>0.21 \); that is, the CB will rationally indulge in seemingly irrational belligerence in Game 2 at \( t=4 \) if it thinks that there exists a 1 in 5 chance
that such behaviour at $t=4$ will cause $G$ and $PSB$ to expect similar behaviour at $t=5$ with (minimum) probabilities 0.58 and 0.25 respectively.

Of course deviant behaviour, even when rationalisable, cannot be guaranteed to succeed in deterring $G$ or $PSB$ from moving at $t=5$. If, for instance, $G$ anticipates $q'_{G}>0.2$, then it will expect a rational $CB$ to resist both ‘moves’ at $t=4$ in which case $G$ will ‘move’ again regardless at $t=5$. But then again if $G$ expects a rational $CB$ to anticipate that and $CB$ still resists both ‘moves’ at $t=4$, then $G$ may start worrying again that $CB$’s behaviour may augur more irrational (or more puzzling) resistance at $t=5$. And if $CB$ anticipates that $G$ may think that, $CB$ may rationally go ahead with its deviance at $t=4$. And so on.

Concluding, the reputational link between the two contests facing the Central Bank allows it more elbow room than would be possible during the earlier rounds of the supergame. Somewhat surprisingly, an ambiguous reputation has the potential of shielding the Central Bank (until just before the end of its term) from miscellaneous challenges to its monetary authority (e.g. over control of medium term interest rate movements) without encouraging government interference over inflation targets. Moreover the effect of that protection can spread all the way to the game’s last round (that is, the expiry of the Governor’s term in office) provided the Central Bank is prepared to enter a mind game in which it does not presume that its opponents’ beliefs will remain consistently aligned with its own.

A2.9 Concluding remark: The ideology behind US monetary policy before the Crash of 2008

During the period after the Bretton Woods’ collapse and just before the Crash of 2008, the mainstream literature on monetary policy revolved around arguments in favour of some kind of Taylor Rule strategy pursued by a Central Bank that was as independent of government and
the Treasury as possible. This was the monetary policy reflection of the supply-side Washington Consensus elsewhere.

Such arguments routinely highlighted the advantages of effective Central Bank independence for its capacity to enable the monetary authority to sever the vicious cycle of inflationary expectations caused by the ‘unavoidable’ temptation of democratically elected governments to influence real variables. Although it was sometimes acknowledged that ambiguity may benefit the authorities (e.g. see Cuckierman, 1992), these benefits were nevertheless interpreted as inimical to ‘social welfare’. Simply put, whenever ambiguity could be beneficial to the authorities, it was presented as coming at the expense of higher than necessary inflation and potential (short term) losses in the real economy.

During the period of persistently low inflation that followed Paul Volcker’s brutal interest rate policy, and at a time when the Global Minotaur (i.e. American deficits plus Alan Greenspan’s accommodative monetary policy at the time of unexpected slumps – e.g. after the dot.com bubble burst in 2001) were maintaining fairly high levels of aggregate demand, it seemed ever so natural to argue in favour of a Fed or a Bank of England or an ECB that (a) enjoyed full independence from government and (b) pursued a policy of low price inflation without any regard whatsoever over either asset prices or the industrial scale production of financial instruments that soon began behaving like money.

The above analysis has shown that, even within the neoclassical type of (monetarist) analysis, the arguments regarding the ‘social welfare’ benefits from Central Bank independence are terribly exaggerated. My main emphasis was on the potential losses from too little ambiguity regarding the Treasury’s influence over the Central Bank. This interesting dimension was brought to light by taking into consideration not only the Central Bank’s interactions with elected government but also with market institutions, e.g. the private Banks, hedge funds, etc.
For the purposes of demonstrating this simple point, I showed that institutionalised independence may be suboptimal when the Central Bank’s objectives extend, beyond a low inflation target, to the maintenance of effective control over the structure of inter-bank rates, the timing of medium-term rate changes and, of course, the control over the instruments of financialisation. In the context of a repeated game, it was possible to demonstrate that the imperviousness of an Alan Greenspan, and his total independence from government, was functional to a financial system over which the Central Bank, the Fed, had lost control.

The point of monetary policy is to control the quantity of money and its price. From the time financialisation took off, toward the end of the 1980s, a new form of money came into being: complex financial instruments that quickly turned into a store of value increasingly favoured by financial institutions and also a means of exchange between financial institutions. This type of private of toxic money, by 2002, had decoupled from the official money supply.

If we can show, as the preceding analysis did, that prior to 2008 the Fed had lost its control over aggregate or effective money supply, by means of the neoclassical apologists’ own analysis, the result carries important weight.
Appendix 3 - The rise of Quantitative Easing (QE)

Once the Fed came up against the hard barrier of the post-2008 liquidity trap, Chairman Ben Bernanke opted for QE as a means of regaining control over the money supply – at a time when the Fed’s earlier loss of control had flooded the money markets with financial instruments over whose rate of returns the Fed exercised minimal influence. At the time of writing this, the third round of quantitative easing, QE3, remains active and rumours of the impending ‘tapering’ suffice to cause serious tremours in the world’s financial markets. It is therefore worthwhile taking another look at QE.

According to the Fed’s own announcement, every single month America’s central bank is committed to buying from banks and other financial institutions $85 billion of paper titles backed by mortgages (so-called mortgage backed securities, or MBS). The Fed is making these purchases by crediting electronically the accounts that those institutions have at the Fed with the sums necessary to take these pieces of paper (the MBS) off their books. However, this new balance of dollars in the banks’ Fed account cannot be lent to customers or business directly. They can only be swapped with other paper assets held by other banks. This is crucial for understanding why QE is not the same as money printing. Despite the technical nature of the ‘transactions’ involved, it is worthwhile taking a close look at it.

When the Fed buys $1000 worth of MBS paper from Bank X, $1000 is taken out of the bank’s ‘assets’ column in the Bank X’s balance sheet and is replaced by $1000 spending money held at a ‘reserve account’ Bank X keeps with the Fed. The said account is called ‘reserve’ because of the conditions the Fed attaches to its uses. To be precise, the Fed stipulates that this $1000 can only be lent to other banks or used to buy other paper titles from other banks. Thus, the only way that the Fed’s purchase of this $1000 ‘worth’ of MBS can find itself into the economy is if Bank X wants to buy some other piece of paper from another bank, say Bank Y. But even if
it does, the money will enter the real economy only if that piece of paper title is new; e.g. if the Bank Y had just lent $1000 to some customer and passed this loan on to Bank X. If the paper title concerned is old, pre-QE, debt, all that QE would accomplish is that a paper title worth $1000 would pass from the books of one bank to the books of another. The $1000 would simply never enter the circular flow of income.

This is precisely why QE cannot fuel inflation. Indeed, it is the reason why the 2012 US inflation rate was lower than it had been two years before – despite the massive volumes of QE1 and QE2 that were effected. So, what was the logic behind QE? Mr Bernanke’s stated purpose was that the Fed’s purchases of MBS should increase their price, setting off the following chain reaction:

- increased MBS prices would push down the interest rates people demand from them before purchasing MBS paper (since they will now sport more attractive price-growth potential)
- the lower interest rates associated with MBS paper will translate into lower interest rates for new mortgages
- the lower interest rates on mortgages will boost the demand for new homes
- the extra demand for housing will push up house prices
- the increasing house prices will reduce the number of American families whose home is worth less than the mortgage that they have out on it, turning them into mortgage-slaves).

If all this transpires, the next hope was that a reduction in the incidence of mortgage-bondage in American society (‘negative equity’ in the parlance of financiers) would cause more families to spend more readily, many to sell up and move to an area where they can find work more easily, others to slow down the rate at which they pay down existing debt (and spend some
more] and, importantly, a shift of investors from MBS paper purchases to corporate bonds (i.e. more lending directly to corporations). This was the Fed’s heroic theory of how its QE3 would deliver the nation from recession. What’s wrong with it? One simple omission: that for QE’s virtuous wheel to start turning, a multiple coincidence of almost impossible beliefs must be formed:

- Jack and Jill, who are Bank Y’s customers, must trust that the real estate market has bottomed out in the medium term and that their job is secure, so as to dare ask Bank Y for a mortgage.
- Bank Y must be willing to take the risk of stretching its already large ‘assets’ column, by lending Jack and Jill to buy a house in the hope that some other bank, Bank X, will buy that iffy mortgage from it using its QE-funded ‘reserve account’ at the Fed.
- Firms that are thinking of employing people like Jack and Jill (in the medium to long term) must believe that Bank X will indeed buy Jack and Jill’s mortgage from Bank Y and, moreover, that this sort of transaction will increase demand for their products, thus justifying more hires.

To cut a long story short, a great deal of ‘believing’ must occur before QE delivers on its promise to boost employment and help the real estate market recover. Alas, given the prevailing state of self-confirming pessimism, to expect that these beliefs will flood into the different agents’ minds at once is to believe in miracles.

To recap, ever since America became ungovernable (with a White House and a Congress at loggerheads), the Fed was the only branch of government with any capacity to act upon the recession. QE helped to some extent slow it down, if only because someone was doing something ‘big’. However, as long as it did nothing directly to reduce the size of the debts
people faced, or to increase the wages whose low levels was [from the 1970s onwards] a fundamental root-cause of the problem, QE was never going to deliver.

While QE’s side effects may be nowhere near as toxic as the Fed’s ardent opponents make them out but, nonetheless, they are real: Mainly, QE boosts the probability of another domestic financial market crash (see Figure 8 above) and, additionally, gives bankers an incentive to lend overseas, just like Japan’s QE in the 1990s led to the carry trade that boosted the capital flows into the United States. As a result the exchange rate of developing currencies (Brazil being a case in point) appreciates fast, with the result of higher commodity (particularly food) prices that worsen the circumstances of the less well off Americans and threaten developing nations with rapid capital inflows which (as South East Asia, Ireland and Spain can testify) can quickly turn into an exodus that leaves much damage in its wake after the Fed begins to ‘taper’.

Quantitative Easing and the quality of the public debate in the United States

Perhaps the worst side-effect of QE is that traps public debate in a cul-de-sac. By focusing on QE, on the pros and cons of a new Gold Standard (seen as the opposite of the Fed’s ‘unconventional methods’), on the unsustainability of the federal debt, on whether the solution lies perhaps in a large reduction in living standards, Americans are thrown off the key point: the cause of their distress is the fact that, for the first time since World War II, the United States lost its capacity to recycle the planet’s surpluses. Without an alternative mechanism for achieving this recycling, America’s (and the world’s) capacity to recover is severely circumscribed.

Quantitative easing and other related policies operate primarily through two channels. The first is the so-called portfolio channel, whereby central bank purchases of government paper
lead to lower long-term interest rates, encouraging investors to switch into higher-yielding but riskier assets. This is supposed to make it easier for companies to raise money, boosting investment; households should also enjoy bigger gains in wealth, thereby prompting faster consumer spending. This channel has not worked as well as expected. Asset prices have surged but the results have been otherwise mediocre. A chasm has opened up between financial hope and economic reality. By limiting export prospects for producers elsewhere in the world, a slowdown in Latin America, and indeed in China, only widens the disconnect. There are also unexpected and undesirable feedback effects as, for example, the recent credit crunch in China (May-June 2013) which played a significant role in pushing the Fed toward insinuating an early exit from QE3.

Of course, removing monetary support at a time when interest rates are at the zero bound threatens a sudden correction in asset prices. The second channel works through a falling exchange rate. Some argue that one country’s QE-related exchange rate decline will ultimately bring benefits for other countries. Faced with a loss of export earnings, those who have chosen to avoid QE (e.g. the Eurozone) will eventually be forced to follow suit, thereby triggering more in the way of domestic portfolio effects. But if the domestic economic effects of QE are disappointing, the primary effect of exchange rate declines will be to boost exports. With lacklustre global growth, that will surely only lead to accusations of waging currency wars. This second channel is therefore bound to be a source of tension in Asia thanks to Japan’s substantial continuing monetary loosening. At the beginning of 2013, there were high hopes that the world economy would be dragged out of its torpor, thanks to the copious use of unconventional monetary policies, with a strong recovery in the US and China. Monetary policy, however, appears to have hallucinatory effects. In reality, the slow or non-existent recovery in the developed world will force China to taper its own unsustainably high investment ratios. Add to this a highly likely ‘correction’ of asset prices in Wall Street (caused either endogenously or because of the Fed tapering QE3) and the actual picture of a recessionary path appears.
In conclusion, Quantitative Easing is a stop-gap measure by a Fed that has long ago lost its effective control over monetary policy but which, sadly, remains the only branch of the United States government capable of acting in some form in order to stem recession. However, the worst aspect of the Fed’s extraordinary, unconventional methods is that they have attracted too much of the public’s attention away from the real task in hand: how to mobilise idle global savings in the fight against the forces of global recession.
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Notes

1 See Taylor (2010) where the author claims that the following diagram represents the past the nominal interest rates should have followed if the Fed had stuck to the Taylor Rule:

2 Speech delivered on 8th November 2013, Speech at the IMF’s 14th Jacques Pollack Annual research Conference ‘Crises: Yesterday and Today’

3 For a full exposition of this hypothesis see Varoufakis (2011/3), Varoufakis et al (2011) and Varoufakis (2013).


5 Lohmann (1992) examines the half-way regime under which the Central Bank Governor is independent but the government retains the right to fire him/her. See also Bordo and Kydland (1990) for an historical example of escape clauses from rigid targets.


8 See Alesina and Gatti (1995)

9 See McCallum (1995)

10 See the closing remarks in Goodhart (1994).

11 See also Roel, M., W. Beetsma and H. Jensen (1999)

12 We assume that the natural rate of y is normalised at zero.

13 The assumption that wage-setters cannot observe the supply shock while the government can, is a convenient device for capturing the nominal rigidities involved in the labour market. Alternatively these same rigidities (which, as Rogoff, 1985, pointed out, spawn the need for stabilisation policies in rational expectations models) could be modelled by means of more complex overlapping wage contracts.

14 Notice that the more conservative the administration of CB the greater the social loss following heavy supply shocks since the inflation target will no longer be affected by the actual value of ε.

15 Notice that as y/y tends to infinity, there is no difference between (a) appointing a CB with instrument-independence (though no goal-independence) and (b) institutionalised strong CB independence (*a la* the Bundesbank).
There is of course the added worry that governments may change with the incoming administration entertaining a different (relative) valuation of inflation; i.e. see Alesina and Gatti (1995).

If the government wants to commit even more strongly to its \( n^* \) policy, it can do so by increasing its own costs \( (f) \) from confronting a Governor who simply wants to stick to the \( i=1 \) target. This it can do by announcing \( n^* \) with fanfare as well as by giving opposition newspapers (at \( i=1 \)) a firm commitment never to attempt to alter the CB’s target during its period in office. That would ensure a high cost \( f \) if the G-appointed CB were to go to the press with stories of intimidation and attempts to alter \( n^* \).

Punishment can take many different forms; e.g. reduction in funding, refusal to cooperate in seconding staff from Ministries to the CB, the creation of an unpleasant atmosphere in meetings, the spreading of rumours viz. the incompetence of the Governor etc. Here we assume that the CB’s reputation loss from deviating from the original inflation target, as well as the penalty it will suffer if it does not, can be expressed as linear functions of the size of that deviation sought by G.

For simplicity we assume also that at \( i=0 \) base rates, short term \( (r) \) and medium term \( (R) \) rates are normalised at zero.

Hargreaves-Heap and Varoufakis (1989) first mentioned the analytical value of such a reputational linkage.

Of course any number of alternative inverse relationships could emerge. We select \( p=1-s \) for simplicity.

Recall that both Games 1 and 2 are extensive form interactions; Game 1 comprises two periods while Game 2 consists of up to \( m \) periods (see Sections A2.2 and A2.3 respectively). In this section it is assumed that each of these extensive games is repeated \( T \) times. In each of these \( T \) rounds Games 1 and 2 are played simultaneously.

Note that inequalities (17) and (18) were derived from G’s and PSB’s expected returns from making a move; namely, \( ER^G (move) = (1 - (1 - p^G) \times \phi^G)(-1) + (1 - p^G) \times \chi^G \times d \) (19) and \( ER^{PSB} (move) = (1 - (1 - p_{PSB}) \times \phi_{PSB})(-1) + (1 - p_{PSB}) \times \phi_{PSB} \times b \) (20).

Also note that \( p^{PSB} \times = 1/(1+b) \) and \( p^G = d/(1+d) \); i.e. the last round sees a return to the one-shot reputational thresholds.

Substitute \( x_t = \phi^G = 3/4 \) into (17) and (18).

\( x^* \) is the root of quadratic \( [(1+b)(1+d)(1-x_t)]x_t - (1-x_t)(1+b) = 0 \) which is derived by setting equation (19) equal to equation (20) and \( x_t = 1 - \phi^G \).

Equations (21) and (22) derive from Bayes’ rule see Kreps and Wilson (1982); i.e. \( Pr(CB \text{ fought } G \text{ at } t) = \frac{Pr(CB \text{ would have fought at } t \text{ if independent }) \times Pr(CB \text{ was independent }) + Pr(CB \text{ would have fought at } t \text{ if dependent }) \times Pr(CB \text{ was dependent })}{Pr(CB \text{ fought } G \text{ at } t)} \)

In general, letting \( t' \) be the time period at which \( x^* \cdot x = 0 \) where \( x \) is the root \( M_{[0,1]} \) of quadratic \( [(1+b)(1+d)(1-x_t)]x_t - (1-x_t)(1+b) = 0 \), if \( p_t M_{[0,1]} x < j=1,..,t \) and \( p_t M_{[0,1]} x < j=t+1,..,T \) the CB’s overall payoffs from an ambiguous reputation at the beginning equal \( \ell'(a+h)+(T-t'-1)a \). Otherwise, a solid reputation \( (p) \)
as an independent CB will yield $T_h$. Thus as long as $t > h/a$ the CB will prefer that there is at least some doubt about its independence even when it is truly independent.

28This is so because $p \in [0.4, 0.866]$, $p_2 = p_{11} \in [0.482, 0.8]$ and $p_3 \in [0.578, 0.7]$

29For simplicity we have assumed that $p = 1 - s$. More realistically $p$ and $s$ would be linked by a function $p = f(s)$ such that $f(s) < 1$. Out-of-equilibrium resistance by CB of both G and PSB ‘moves’ may encourage the latter to think that they overestimated the absolute value of $f'(s)$.

30The conditions for G and PSB to ‘move’ at $t=5$ are $-p_5 + (1 - p_5)q_G + 5(1 - p_5 - (1 - p_5)q_G) > 0$ and $-[(1 - p_5) + psq_{PSB}] + (1 - (1 - p_5) - psq_{PSB}) > 0$ respectively. Since Bayes rule has not been activated at $t=1, 2, 3$ and it cannot handle out-of-equilibrium information at $t=4$, $p_5 = p = 0.6$.

31The CB’s expected returns from deviating as opposed to not deviating are given $10q_G' + q_{PSB}' - 2$ and $1 - (1 - q_{PSB}')$ respectively. Thus a rational CB will deviate as long as $q_G'$ is at least equal to 0.2.

32A parallel can be drawn between this type of non-equilibrium argument and Bernheim’s (1984) rationalisability. G&PSB on the one side and CB on the other are caught up in a situation where there is a closed loop of conjectures. If rational they can discern the loop but they have no way of homing in on the same point of that loop simultaneously. Thus, the indeterminacy which makes room for rational bluffing even in this case where there exists a unique (sequential) equilibrium.

33Our analysis supports the view that the pertinence of Central Bank independence depends on the degree of cross ownership between banks and manufacturing industry. In economies where the ownership of banks and manufacturing corporations is interwoven (e.g., Germany), private banks may be less ‘trigger-happy’ vis-a-vis interest rate changes (fearful of the effect a high variance will have on their manufacturing partners). In those economies formal Central Bank independence comes at next to no cost as our Game 2 loses significance. By contrast, in economies with a greater degree of segregation between manufacturing and financial capital (e.g., the UK) Game 2 is important and, therefore, Central Banks may benefit from less than full independence. The existing institutional arrangements (e.g., those of the Bundesbank in past years, of the European Central Bank currently and, of course, of the Bank of England) may reflect the varying significance of interactions such as our game between the Central Bank and the private banks.
Financialisation, Economy, Society and Sustainable Development (FESSUD) is a 10 million euro project largely funded by a near 8 million euro grant from the European Commission under Framework Programme 7 (contract number: 266800). The University of Leeds is the lead co-ordinator for the research project with a budget of over 2 million euros.

THE ABSTRACT OF THE PROJECT IS:

The research programme will integrate diverse levels, methods and disciplinary traditions with the aim of developing a comprehensive policy agenda for changing the role of the financial system to help achieve a future which is sustainable in environmental, social and economic terms. The programme involves an integrated and balanced consortium involving partners from 14 countries that has unsurpassed experience of deploying diverse perspectives both within economics and across disciplines inclusive of economics. The programme is distinctively pluralistic, and aims to forge alliances across the social sciences, so as to understand how finance can better serve economic, social and environmental needs. The central issues addressed are the ways in which the growth and performance of economies in the last 30 years have been dependent on the characteristics of the processes of financialisation; how has financialisation impacted on the achievement of specific economic, social, and environmental objectives?; the nature of the relationship between financialisation and the sustainability of the financial system, economic development and the environment?; the lessons to be drawn from the crisis about the nature and impacts of financialisation?; what are the requisites of a financial system able to support a process of sustainable development, broadly conceived?
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