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MONETARY AND FISCAL POLICY IN THE GREAT MODERATION AND THE GREAT RECESSION[†]

Abstract

In this paper we argue for a new approach to monetary and fiscal policy. During the Great Moderation, the inflation targeting regime worked well. Central banks used the interest rate to stabilize inflation, and—subject to inflation being controlled—stabilized the level of demand. Fiscal policy exerted discipline over the public-sector deficits, thereby—indirectly—managing the level of public debt. Such 'fiscal housekeeping' worked well, because the monetary authorities were stabilizing the economy. But once private-sector deleveraging led to the Great Recession, and interest rates hit their zero bound, the economy could no longer be managed by monetary policy. Since then, recovery has come to depend on the 'automatic stabilizers': as output and tax revenues have fallen, public debt has been created, producing the assets which a deleveraging private sector wishes to hold. But the effect has been very gradual. Recovery would have been faster if fiscal policy had been responsible for the restoration of full employment, in an environment which tolerated the necessary rises in public debt. Conversely, policies of austerity, designed to reduce public debt, have slowed the recovery. Growth will not be resumed until the private sector begins to invest strongly again, creating the financial assets which the private sector wishes to hold, thereby enabling public debt to be retired. This has not yet happened because the private sector, correctly, does not believe that macroeconomic policy is capable of sustaining a strong recovery.

JEL Classification: E44, E52, E58, E61 and E62
Keywords: fiscal policy, inflation targeting, monetary policy, quantitative easing and zero lower bound

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Monetary and fiscal policy in the Great Moderation and the Great Recession

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I. Introduction and summary

Economic policy-makers had much to be proud of during the Great Moderation when the global economy was effectively managed. Monetary policy controlled inflation and stabilized the economy. Fiscal policy was not used for these purposes. It was directed towards the longer-term concerns of fiscal sustainability and was focused on the control of budget deficits and the stabilization of

government debt. We call this arrangement the New Consensus Assignment (or NCA). The NCA was widely understood.

This all changed with the onset of the global financial crisis (GFC) in 2007 and the subsequent Great Recession. The present paper puts forward an extremely simple story as to why things changed. Once interest rates reached their zero bound, monetary policy could no longer be used to stabilize the economy. But the continued use of fiscal policy to carry out the tasks assigned to it by the NCA— controlling budget deficits and stabilising government debt—meant that nobody was stabilizing the economy. It is hardly surprising that private-sector confidence in the efficacy of macroeconomic policy was greatly damaged and that, in most countries, private expenditure, including private investment, have been slow to recover.

In this paper we draw the obvious conclusion from these facts: the NCA needs to change.[1] Fiscal policy should have replaced monetary policy once interest rates reached their zero bound; fiscal policy should have targeted the full employment of resources. That would have required a temporary acceptance of the high fiscal deficits and of rising public debt. Even now, we argue, such a revised fiscal policy-rule should be in place; it should remain in place until the recovery is finally firmly established.

Our overall point is that a macroeconomic policy regime will work well if, and only if:

(i) it is clear which policy-maker is assigned which objective;
(ii) the objectives are achievable; and
(iii) the private sector believes that the objectives will be achieved.

This was the case during the Golden Age after the Second World War, and it became true again during the Great Moderation. But it was not true after 1971, when the Bretton Woods system collapsed, until around 1990; and it is not true now. We show that it could become true again only if the role accorded to fiscal policy is greatly altered.

Our paper has a US focus. This is inevitable, given the size of the US economy, and the location of many good macroeconomists. But we also consider outcomes, and thinking, on this side of the Atlantic. The focus throughout is on the policy issues faced by advanced countries. For reasons of space, we cannot pay much attention to the particular problems of countries within the euro area.

In more detail, the plan of the paper is as follows.

We begin, in section II, by looking backwards. We do this because it is possible to learn about how the NCA should be reformed by first understanding how it came into being. We thus provide a stripped-down analytical history of macroeconomic policy-making, ever since the Golden Age. This account is 'history' because we describe *what* things happened; it is 'analytical' because we show *why* things happened.[2] We describe the Keynesian policies that were in place during the Golden Age, embedded within the Bretton Woods system. We identify which policy-maker was responsible for which task, and we then describe why this system disintegrated. After this, we describe the main changes in macroeconomic theory and policy that occurred after that disintegration, changes which were important in leading up to the Great Moderation.

[1] Unlike Reinhart and Rogoff (2009), we do not believe that recovery from the GFC needs to be slow.
[2] 'Why' means both why, as seen by those acting then, and why, as seen by us looking back, using theory which they did not yet possess.

Section III describes the inflation-targeting regime that emerged at the beginning of the Great Moderation, and shows the way in which this regime pinned down expectations that inflation would be low and that output would grow in a sustainable way. We then describe the emergence of the NCA, which became the overall framework in which the inflation-targeting regime was embedded. Put simply, during that regime, fiscal policy came to be focused more and more on the management of public debt. We show that this management could be carried out in a way which did not prejudice the operation of the inflation-targeting regime.

Section IV discusses the Great Recession, a catastrophe which happened because the private sector had over-borrowed and then set about deleveraging. Output fell spectacularly, and expectations about future growth were shattered. Once interest rates hit their zero bound, the fall in output could no longer be counteracted by an active monetary policy. We show how the fall was only contained by the operation of fiscal policy: the automatic stabilizers meant that output did not collapse, and then began recovering, even if slowly. These two things happened because the large public-sector deficits—which emerged when output fell—supplied the assets which a deleveraging private sector was demanding.

But this gradual recovery was sabotaged by the fiscal policy of austerity which emerged at the G-20 summit at Toronto in June 2010, a policy guided by the NCA. This approach to fiscal policy saw the fiscal deficits which had emerged by then not as friend but foe. As a result, fiscal policy was deliberately and significantly tightened. Such a policy—popularly known as austerity—has made the recession both deeper and more persistent.

In the concluding section V, we advocate a different approach to fiscal policy in these circumstances. Until interest rates return to more normal levels, the aim of fiscal policy should be to return the economy to full employment. Alongside this there should be an aim to shift expectations, as rapidly as possible, back towards a more normal outlook, one in which there is widespread confidence that there will be sustained growth. In the interim such a policy will require a tolerant attitude to deficits and debt. We argue that a full recovery will not emerge until the private sector begins to invest strongly again, and thereby create the financial assets which a deleveraging private sector wishes to hold. Then, and only then, should fiscal consolidation begin. Such a recovery in investment has not happened, we argue, partly because the private sector—with complete justification—does not yet believe that policy-makers have the economic instruments and the will to ensure a sustainable recovery. A sustainable recovery will emerge only when there is a change in the way in which fiscal policy is conducted.

II. Before the Great Moderation

(i) The post-war Golden Age assignment: success and then collapse

The ‘Golden Age’ began soon after the Second World War. This was a successful period; prosperity gradually spread outwards from the US, the global technological leader, first to Europe and then to Japan. Rapid growth became possible again, of the kind which had occurred before the First World

War.[3] This growth process, and the international convergence which resulted from it, is well described by an (augmented) Solow growth model (Solow, 1956; Mankiw *et al*., 2002).

During the Golden Age, there was a broad consensus about the objectives of macroeconomic policy-making—full employment without inflation or balance-of-payments difficulties—and a clear assignment of policy instruments to the pursuit of these objectives. This assignment had three components (Swan, 1960). First, Keynesian demand-management policy had the objective of full employment; fiscal policy was the instrument of choice.[4] Second, inflation was low.[5] But, as and when necessary, inflation was controlled by prices-and-incomes policies (Fellner *et al*., 1961). Third, the exchange rate was assigned to the preservation of external balance: the international monetary system established at Bretton Woods required a country's exchange rate to be devalued as and when the country experienced a sustained current account deficit.[6] This assignment of instruments to targets came about primarily for political economy reasons, rather than because instruments were being assigned to the targets over which they had a comparative advantage.[7]

There was widespread confidence that the objectives of policy would be achieved. A famous article by Baily (1978) suggests that, in the US, demand management (and the anticipation that it would be applied) was an important part of the reason for low volatility and success. For the UK, Matthews (1968) argued similarly that benign expectations lay behind the high levels of investment in the 1950s and 1960s, and he also attributed much of this to the prevailing macroeconomic framework of the time.[8] It became possible to argue that good outcomes emerged because people believed in the policy framework and thought that policy-makers would achieve their aims.[9]

But the Golden Age was vulnerable, in ways which are well known.

First, confidence disappeared internationally. An increasingly uncompetitive US economy, with a high level of domestic demand, inevitably experienced a growing current account deficit.[10] But the US was unwilling to devalue its exchange rate—and unable to do so because it was pegged to gold. Furthermore the surplus countries—Germany and Japan—were unwilling either to change their exchange rates or their domestic policies.[11] Growing mobility of capital made this unbalanced system increasingly precarious.[12] The system collapsed when a lack of confidence by the private sector led first to devaluation of the pound in 1967 and then, in 1971, to a collapse of the whole Bretton Woods system (Temin and Vines, 2013).

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[3] See chapter 2 of Keynes (1919) for a succinct contemporary account of why the global economy worked well in the late Victorian era.

[4] This was true even in the US. There was a serious attempt to use fiscal policy pro-actively during the Kennedy–Johnson era in the 1960s: taxes were cut with the aim of promoting growth.

[5] 'Adherence . . . to the rules of Bretton Woods gave the US low inflation and low expectations of inflation.' (Sargent, 1999, p. 2)

[6] The exchange rate also became something of a nominal anchor (see Swan, 1960; Corden, 2002).

[7] Mundell (1960) was the first to set out the idea that a policy instrument should be assigned to the policy objective over which it has a comparative advantage.

[8] See also Eichengreen (1996) and Cameron and Wallace (2002).

[9] See our more formal discussion of this point in section II(ii).

[10] See McCracken *et al.* (1977). There were parallel problems in the UK.

[11] The tensions which emerged were very similar to those which both Maynard Keynes and Harry Dexter White had feared when setting up the Bretton Woods system a quarter of a century earlier (see Vines, 2015*b*).

[12] The 'Triffin problem' identified difficulties arising from the increasing proportion of US dollars in the stock of international reserves. But the fundamental problem was not something to do with the composition of international reserves. It was to do with the vulnerability of the underlying macroeconomic policy regime.

It also became apparent that the Golden Age regime was creating an inflation bias. In the US, Milton Friedman (1968) famously argued that US policy-makers were aiming for an excessive level of output, thereby moving too far along a short-run Phillips curve and raising inflationary expectations. Kydland and Prestcott (1977) and Barro and Gordon (1983) suggested that this happened because policy-makers are intrinsically untrustworthy; it is optimal—they said—to promise low inflation and then to renege on that promise. Orphanides (2004) provides a better explanation, suggesting that US inflation accelerated because policy-makers repeatedly overestimated the potential level of output.[13] In the UK and continental Europe, Keynesian policies made it impossible to resist union militancy and the wage 'explosions' of the late 1960s. This was an international phenomenon; the events of May 1968 in Paris were just the most famous example. Confidence in the possibility of achieving full employment and stable prices began to drain away. The collapse of the Bretton Woods system brought that confidence to an end.

The crisis of 1971 was not just a currency crisis, but a collapse in an overall macroeconomic policy-making regime. What policy-makers sought had become inconsistent with what was possible.[14] After the crisis came, economic policy-making was in disarray for nearly two decades.

(ii) Two decades of learning

During the next 20 years, four important new ideas emerged. These provided the necessary conditions for the new policy framework which was put in place during the Great Moderation, which we have labelled the New Consensus Assignment.

Demand-management policy as a nominal anchor

First, in order to control inflation and remove inflation bias, the objective of demand-management policy needed to change. And this happened: demand-management policy came to provide the necessary nominal anchor. In the US, Friedman called for this in 1968; in the UK, Meade made a similar call 10 years later in his Nobel Lecture (Meade, 1978). This change in the overall focus of demand-management policies implied that a high and stable level of employment could only be brought about through supply-side reforms in the labour market, rather than through demand-management policies. This view differed radically from the Keynesian conventional wisdom.[15]

Monetary policy as the instrument of demand management

Second, monetary policy became the primary instrument of demand management rather than fiscal policy, as had previously been the case. This too involved a convergence with the ideas of Friedman. One reason for this change is that fiscal policy is subject to time lags, both in decision-making and in implementation. Another reason is that monetary policy can be delegated to an independent central bank, free from political influence. A less important reason is that put forward by Barro (1999): when taxes are—for example—cut, then individuals will know that they will need to be raised in the future and so will not change their expenditure. And there were additional reasons.[16]

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[13] See De Long (2000) and Sargent (1999) for further discussion.

[14] Something similar happened when the gold standard collapsed in 1931.

[15] The new view was elaborated by Rowthorn (1977), Meade (1982), and Vines *et al*. (1983); it was taken up and developed by Layard *et al*. (1991).

[16] The new Keynesian model shows that monetary policy has a comparative advantage over fiscal policy in the control of inflation because changes in the interest rate induce changes in the labour supply which changes in government expenditure do not cause (see Luk and Vines, 2015). Furthermore, as discussed below, in an open economy monetary policy has a comparative advantage over fiscal policy in the control of inflation because it

Friedman proposed monetary targeting as a way of implementing the necessary monetary policy. Such (intermediate) targets were introduced in the early 1980s in Britain and (briefly) in the US; in Britain the experience was incoherent (Allsopp, 1985). Not only was there massive unemployment, but the targets were unmanageable: the demand for money is volatile and the supply of money cannot be controlled. Alternative targets were tried, including various measures of 'money' and the exchange rate. There had to be another way. In his Nobel Lecture and elsewhere, Meade (1978, 1981) suggested that a nominal anchor be put in place, not by controlling some concept of the money supply but by introducing a nominal income target. He opted for this, rather than an inflation target, because he thought that the latter would be too inflexible. In fact, policy-makers have taken Meade's lead but have surmounted the difficulties which he identified; they have done this by introducing *flexible* inflation-target regimes, in which inflation shocks are only removed gradually. And central banks have also moved away from Friedman by using the interest rate as the policy instrument, rather than by trying to control the money supply.[17] This move to the use of the interest rate as the policy instrument has had the effect of making the LM curve in the IS/LM system extremely misleading.[18]

We ended up with inflation-targeting regimes in which the interest rate is used as a policy instrument to control inflation. Since then, the world has learned that, providing that inflation is under control, the policy authorities can also conduct a stabilization policy which ensures that the resources of the economy remain fully employed.[19]

This new monetary-policy regime has made use of, and indeed came to require, floating exchange rates, which is the regime that emerged after the collapse of the Bretton Woods system.[20]A floating exchange rate enables a country to separately use its interest rate as a policy instrument even in the presence of open international capital markets.[21] In such a system it is possible, at least in principle, for policy-makers to use movements in the interest rate to insulate a country from shocks, both domestic and foreign.

An understanding that policy regimes need to be credible systems

Third, the development of this new approach to macroeconomic policy-making coincided with the rational expectations revolution in macroeconomics. Initially, Robert Lucas (1976) famously produced what seemed like an anti-interventionist argument—the 'Lucas critique'. Active, interventionist policies were likely to be badly designed, he said. They would be based on

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induces movements in the exchange rate, the effects of which complement the effects of the movements in the interest rate.

[17] Early versions of interest rate rules were provided by Weale *et al*. (1989) and then by McKibbin and Henderson (1993) and Taylor (1993).

[18] The LM curve is built on the assumption that the monetary base is fixed in supply. It is a misleading construct partly because the demand for money by the private sector is volatile, and partly because the supply of money to the private sector is volatile, even if the central bank does control the monetary base. But more than this, if the interest rate is the policy instrument, then no attempt is made by the central bank to control the monetary base. Despite this irrelevance, the IS/LM model is still taught to many long-suffering undergraduates.

[19] Such a competency, discussed in section III(i) below, is something which Friedman did not think would be necessary.

[20] Canada had shown the way here, moving to a floating exchange rate in the late 1950s. By contrast, European policy-makers have remained resistant to floating exchange rates to this day.

[21] Thus was born the 'impossible trinity'. If the exchange rate of a country floats, then it is possible for it to have an independent monetary policy, even in the presence of a high degree of capital mobility. But it cannot have an independent monetary policy if it also has a fixed exchange rate. This was explained by Fleming (1962) and Mundell (1963). This finding is true even though uncovered interest parity appears to tie down interest rates in each country to be equal to those in other countries: a movement in the interest rate in one country can induce movements in that country's exchange rate that set up expectations of exchange rate change which exactly compensate for any interest rate differential (Dornbusch, 1976).

macroeconomic models estimated on data from an earlier period in which the policies were not in operation. But the private sector would observe the new policies and so would change its behaviour. That meant, he said, that the policies would need to be different from those which had been designed.

But the Lucas critique is not an anti-interventionist idea. Activist policy regimes can work well if they are both feasible and believed in. This was true in the Golden Age and in the Great Moderation.[22] But it has not been true in the Great Recession. It needs to become true again.

Macroeconomists designing practical policies have understood this point: they now use models containing explicitly forward-looking actors. In the preface to the online version of his influential book, *Macroeconomic Policy in a World Economy: From Econometric Design to Practical Operation*, John Taylor identifies the necessary features of such models (Taylor, 1993).[23] Such models[24]can be used to show how policy regimes become more sustainable when the private sector believes them to be sustainable.

A move towards financial liberalization

Finally, from the 1980s onwards there was a growing belief in the self-regulating nature of financial markets. Belief in the efficient markets hypothesis went hand-in-hand with the rational expectations revolution. This development is described in detail in the paper by Colin Mayer in this issue of the *Oxford Review of Economic Policy* (Mayer, 2015). It led to an outcome in which inflation-targeting regimes were combined with widespread financial deregulation.

III. The New Consensus Assignment and the Great Moderation

By the early 1990s, inflation targeting had emerged: to be carried out by monetary policy, through active use of the interest rate as policy instrument. This regime was particularly simple. The active management of the economy is assigned to a single institution, the central bank, using a single instrument, the interest rate. And this is all there is—only one target and only one instrument. Such 1–1 macroeconomics is much simpler than the policy regime in the Golden Age, when fiscal policy, monetary policy, exchange-rate policy, and prices and incomes policy were all part of active macroeconomic policy-making.

This simplicity was necessary for the emergence of what we will call the NCA of policy instruments to policy targets. But it was not sufficient. It was also necessary to pin down the role of fiscal policy.

Changes in government expenditure, or in tax rates, could have been used as active policy instruments within the inflation-targeting regime, either instead of the interest rate policy or as a partial substitute. But we saw in section II(ii) that this was not done, for good reasons. The role found for fiscal policy was, instead, that it be used as the instrument for ensuring fiscal discipline—i.e. for targeting public-

[22] They were so successful during the Great Moderation that Lucas (2003) argued that 'the central problem of depression-prevention has been solved, for all practical purposes, and has in fact been solved for many decades'.

[23] He writes that 'the five . . . essential features of [a] . . . macroeconomic model . . . are (i) Rational expectations, (ii) Staggered price and wage setting that generates long run monetary neutrality and short run impacts of monetary policy, (iii) Forward looking decision rules for consumption and investment, (iv) Financial arbitrage conditions linking interest rates in different countries and long term to expected future short term interest rates in each country and (v) Monetary policy rules'.

[24] The earliest versions of these models were constructed in the UK by the Meade group (Weale *et al*., 1989), and in the US by Taylor himself (Taylor, 1993), and by Warwick McKibbin, working initially with Jeffrey Sachs (McKibbin and Vines, 2000). More recent, best-practice versions include the Smets and Wouters (2003) model of the European Union, and the Christiano *et al*. (2005) model of the US economy.

sector deficits and debt—in the knowledge that this would influence the interest rate which emerged. The necessary movements in the fiscal position were allowed to be gradual. In particular, fiscal policy came to allow the automatic stabilizers to operate over the economic cycle. The reasons that this was done were partly microeconomic—tax smoothing is a good idea (Barro, 1999); partly macroeconomic—allowing the automatic stabilizers to operate would make it easier for the monetary authority to control the economy; and partly practical—balancing the budget year by year would give rise to very large administrative costs.

We call this kind of assignment of monetary and fiscal policies the New Consensus Assignment (NCA): monetary policy to control inflation and manage demand; fiscal policy to ensure fiscal discipline; and each according to its own timetable. We argue that, within the NCA, fiscal policy emerged as a Stackelberg leader. Fiscal policy targeted deficits and debt. But it did this in the knowledge that monetary policy would stabilize the economy, and thus in the knowledge of the interest rate which would emerge.

Two more things were necessary in order to put the NCA in place.

First, external imbalances could have become tangled up in the NCA. But, as described in section II(ii), this new world was one of floating exchange rates. Confidence in the efficient markets hypothesis led to a view that, internationally, capital would flow to where it was most needed, and that the private sector would look after itself, ensuring its own solvency. Furthermore, a disciplined fiscal policy would ensure that national governments remained solvent (Blanchard and Milesi-Ferretti, 2011). In those circumstances the exchange rate would move to a level at which the country as a whole was solvent. In such a world, external balance would become a non-issue. Countries would be able to borrow internationally and—providing that markets did not turn against these countries—the task of ensuring international solvency of a country could be handed to the foreign exchange market. It ceased to be an object of macroeconomic policy. Moreover, in the short run, movements in the exchange rate would contribute to macroeconomic management, in the way described above.

Second, financial stability could also have become tangled up in the NCA. But the belief in the efficiency of financial markets led to the view that policies about financial stability could be confined to the prudential supervision of individual financial institutions. Ensuring financial stability was thus also not part of macroeconomic policy; there was, instead, a widespread deregulation of financial markets. We can say that ensuring the absence of financial crises was handed over to the private-sector financial system, overseen, in part, by supervisors of individual institutions.

Until 2008, the outcomes achieved by monetary and fiscal policy within the NCA were much better than what had been achieved in the 1970s and 1980s, not just in the US and the UK, but in many other countries. As a result, this period became known as the Great Moderation (Bean, 2009).

(i) The role of monetary policy within the NCA

Inflation targeting was actually implemented first in New Zealand, in 1990. The UK came next after it was ejected from the exchange rate mechanism (ERM) of the European Monetary System (EMS) in 1992,[25] but full-blown inflation targeting did not finally arrive until 1997, when the Monetary Policy Committee (MPC) was established at the Bank of England. The US has never formally adopted inflation targeting. But since 1993 actions by the Federal Reserve have been guided by Taylor-rule ideas.[26] Inflation targeting arrived somewhat later in Europe with its adoption by the European Central

[25] Policy-makers were guided by James Meade's group (Weale *et al*., 1989); Taylor-rule ideas were not yet available.
[26] See Kahn (2012). It was in 1993 that John Taylor proposed his eponymous rule.

Bank (ECB), which was set up, following the establishment of European Monetary Union, in 1999. By 2010, the International Monetary Fund (IMF) reported that 26 countries had adopted inflation-targeting regimes (Roger, 2009).[27]

In this new framework, monetary policy was, typically, assigned to an independent central bank,[28] with a clear mandate. Policy procedures were frequently designed to mimic the reaction function of the US Federal Reserve (Allsopp, 2002). In practice, the interest rate reaction function was typically embedded in an institution operating with 'constrained discretion', in the following sense. Formal mandates, such as those of the ECB and of the MPC at the Bank of England, are frequently hierarchical, or lexicographical, with the primary objective being that of price stability and, *subject to that*—or *without prejudice to that*, with a responsibility for the stabilization of output and employment. The ECB is responsible for setting its own goal for price stability (goal independence). The UK has a 'point' inflation target set by the Chancellor of the Exchequer (instrument independence). In the US, the Federal Reserve has a three-way mandate, embracing price stability, stabilization of output, and financial stability. But during the Great Moderation, the Federal Open Market Committee (FOMC)'s interest rate policy[29] was directed towards the first two of these objectives. Initially, the ECB was reluctant to define what it meant by price stability; its current target is 'less than but close to 2 per cent'.

We can describe the workings of an inflation-targeting regime using a simple model.[30] The exposition of the model which follows is verbal; the model is set out algebraically in two previous issues of the *Oxford Review* (Allsopp and Vines, 2000, 2005). In what follows, these two papers are referred to as AV1 and AV2.[31]

There are three relationships within this model. First, output is demand-determined, as in the new-Keynesian tradition; an IS curve shows aggregate demand as depending on the real interest rate.[32] Second, inflation is determined by a Phillips curve, showing inflation as equal to last period's inflation plus a coefficient times the output gap (i.e. the gap between output and its full-employment level).[33] This form of Phillips curve is often described as 'accelerationist': the *rate of change* of inflation is influenced by the *level* of output. Third, the real interest rate is determined by a simple reaction function which shows that the real interest rate is raised when inflation increases. There are just three endogenous variables: output, inflation, and the real interest rate.

This overall set-up is 'macroeconomics without the LM curve' (Romer, 2000); the kind of macroeconomics that we said above became necessary, once it was recognized that the instrument of policy was the interest rate and not some sort of money supply. This kind of macroeconomics has also become known as 'Taylor-rule macroeconomics'. It produces a stable macroeconomic system

[27] Neither the US nor the ECB are classified as 'inflation targeters' in that paper. We take a wider view: the Federal Open Market Committee (FOMC) in the US and the ECB are both important examples of institutions practising flexible inflation targeting.

[28] In the UK, it is the MPC that is independent, rather than the central bank.

[29] The FOMC is a committee within the Federal Reserve System charged with overseeing the nation's open market operations (i.e. the Fed's buying and selling of United States Treasury securities) and thus with setting the interest rate.

[30] This model is even simpler than the toy model presented by Blanchard (2008).

[31] See also Romer (2000), Taylor (2000), Carlin and Soskice (2014).

[32] For simplicity, this approach assumes that the dependence of aggregate demand on the real interest rate is a static relationship, although we also make reference below to the effects of forward-looking decision rules for consumption and investment which depend on expectations about the future which are consistent with the outcomes of the policy.

[33] For simplicity, this approach assumes that expected inflation is equal to last period's inflation, although we also make reference below to the effects on the Phillips curve of forward-looking expectations of inflation that are consistent with the outcome of the policy.

providing that policy adopts the 'Taylor principle': when inflation rises, the nominal interest rate must be increased by more than any increase in the inflation rate, so that the real interest rate rises, and vice versa.[34]

We can use this simple model to help us to describe the four key features of an inflation-targeting regime.

First, it is clear that there must be some kind of constraint on the interest-rate reaction function if inflation bias is to be avoided. Barro and Gordon (1983) suggested that this constraint might be imposed by central bankers themselves, if they attempt to build and preserve a reputation for keeping inflation low, so as to directly influence the setting of wages and prices. In fact, at least in Britain, the constraint has been imposed to preserve the credibility of the central bank as an institution, rather than through an attempt to directly influence wage- and price-setting. In particular, the publication of the minutes of the MPC enables the Bank of England to make clear that its MPC is not aiming for excessive output, and the professional reputations of the 'external' members of the MPC depends on them being seen not to do this (Vickers, 1998).

Second, the system is one in which demand is stabilized. As noted above, the formal mandates of inflation-targeting systems have normally been hierarchical or lexicographical, with the primary objective being price stability and, subject to that, a responsibility for stabilization (Allsopp, 2002). This means that it became an obligation of the monetary authority to counteract shocks to demand, providing that these shocks do not endanger inflation. An example is the massive cut in interest rates which accompanied the dot-com crash between March 2000 and October 2002. The consequence is that a well-functioning monetary policy will not operate with a fixed Taylor rule independent of the conditions of demand—or independent of the determinants of aggregate supply.[35]

Third, such frameworks have a wider range of scope than was immediately apparent. This is because an inflation-targeting system gives rise to a 'two for one principle' (Alesina *et al*., 2001). With a Taylor rule that appropriately targets inflation, and responds to changes in demand, not only will inflation home in on target inflation after an inflation shock, but the output gap will also converge to zero.[36] This two-for-one property, described colourfully by Blanchard and Galí (2005) as a 'divine coincidence', depends on the accelerationist nature of the Phillips curve; inflation can only be on target, and unchanging, if output is equal to its natural rate.[37] Of course, if there are shocks to supply, this 'divine coincidence' only holds after the natural rate has been adjusted in the appropriate manner.

Finally, monetary policies of this kind came to be self-sustaining, in two important ways.

(i) The successful targeting of inflation following shocks gradually led inflation expectations to be not backward-looking, as in our simple model, but forward-looking and largely dependent on the inflation target itself. This happened because the private sector had expectations that the policy would succeed in keeping the rate of inflation on track (Kapadia, 2005). In effect, good policy had the effect of stabilizing the expectations of inflation within the Phillips curve. One piece of (indirect) evidence for this claim is the fact that, within weeks of the establishment of the MPC in the UK, the risk

[34] In a more complex, partly forward-looking model, the stability condition is more complex than this, but not in such a way as to obscure the basic message.

[35] Technically, this means that a demand shock should lead the policy-maker to adjust the constant term in any Taylor rule. Strangely Taylor has appeared, on occasion, to deny this, including when he has used an estimated Taylor rule to argue that interest rates were cut by too much at the time of the dot-com crash (Taylor, 2008).

[36] This is the case even if, as here, the output gap does not explicitly feature in the monetary authority's reaction function (as it does in a fully specified Taylor Rule).

[37] It can be shown that this natural-rate property is also a feature of a new Keynesian Phillips curve, even though that equation discounts the effects of future inflation on current inflation. The non-vertical property of that curve, which a number of people have noted, results from a failure to fully allow for the effect of lags, and of core inflation, in the optimization process which is used to derive it.

premium on long-term government bonds in the UK fell by nearly 100 basis points (Balls and O'Donnell, 2002). More direct evidence comes from the decline in the expected rate of inflation at this time.[38]

(ii) The knowledge that monetary policy-makers would competently stabilize demand and output around their full employment levels—i.e. the divine coincidence—led to aggregate demand becoming, at least in part, forward-looking and self-stabilizing. In effect, good policy had the effect of stabilizing the components of private-sector demand in the IS curve. This outcome was analogous to that which Baily described in the Bretton Woods system in the article which we cited above (Baily, 1978). Evidence about this outcome comes from the decline in the volatility of output during the Great Moderation described by Bean (2009).

This combination of successful control of inflation, adaptability to changes in demand, a two-for-one property, and self-sustainability was important in leading to the widespread adoption of inflation targeting in many countries. But just as important was the clear and simple role afforded to monetary policy within the NCA.

(ii) The role of fiscal policy within the NCA

We now use our simple model to consider the way in which the fiscal and monetary authorities interacted within the NCA.

At any point in time, a looser (or tighter) fiscal policy will have an effect on aggregate demand and lead to a higher (or lower) interest rate, according to the interest rate reaction function. Bean (1998) used a model with this feature to argue that the fiscal authority in effect becomes a 'Stackelberg leader': the Treasury will, he said, 'internalize' the monetary authority's (predictable and rule-like) reaction function whenever it acts. Bean was concerned to show that such a set-up eliminates any temptation for the fiscal authorities to engineer an inflationary boom—for example, before an election. His idea had striking political economy implications. It meant that, as long as monetary policy is being made in a way which ensures an absence of inflation bias, there is no need for any institution, or rule, to prevent inflation bias on the part of the fiscal authorities. Even if the fiscal authorities have a preference for a level of output above the full employment level—perhaps desiring to help an incumbent government win an election—they will merely obtain higher interest rates if they attempt to pursue this excessive level of output—not a rewarding outcome. They are thus likely to discipline their own behaviour so as not to over-expand demand,[39] even if they would prefer to do this.

Beyond this, the way in which fiscal and monetary policies interact is a dynamic process, driven by the operation of the government budget constraint: any decision to allow a public deficit now will lead to a higher level of public debt in the future.[40] The extent to which this is allowed to happen depends upon the government's choices about fiscal policy—what we can call its 'fiscal policy reaction function'. These choices will be driven by the government's preferences to have higher expenditure and lower taxes, but also by its concerns for fiscal sustainability, and its wish not to pay too high a

[38] The expected rate of inflation, which had been about 4 per cent immediately before the establishment of the MPC, fell to close to the new inflation target of 2½ per cent soon after the MPC was established. (The previous target range had been 1–4 per cent.)

[39] See Kirsanova *et al*. (2005).

[40] See AV2. Public debt increases whenever the primary surplus of the government is less than the flow of interest payments (after allowing for any growth rate of GDP). For the stock of public debt to be constant, the primary surplus—tax revenue minus government expenditure—must just be equal to interest payments. If, on a sustained basis, the primary surplus were less than this, then government debt would rise without limit and instability would result. And vice versa if the primary surplus were more than this.

level of interest payments. In addition, as output goes up and down over the course of an economic cycle, a decision to keep tax rates constant will cause the automatic stabilizers to operate. These two relationships—the government budget constraint and the government's fiscal policy reaction function—add a fourth and fifth relationship to the simple model which we presented in the previous section. The level of public debt which accumulates—as a consequence of the working of these relationships over time—will have an influence on the economy, since such increases in public debt will add to private-sector wealth and so will stimulate private-sector demand.[41] A higher level of debt will require the monetary authority to set a higher interest rate[42]in order to hold demand constant, which will have negative implications for investment and, in due course, for the capital stock.

We can see that, in any decision which the fiscal authority takes about controlling the level of public debt, it will also be acting as a Stackelberg leader—in the same way as described by Bean but, now, in the longer term. The operation of the NCA meant that whenever it became important to prevent debt rising, government spending could be reduced (or taxes increased) without causing damage to inflation or output: given the operation of the inflation-targeting regime, the real interest rate would be reduced in these circumstances by exactly the amount needed to prevent a negative disturbance to output or inflation. Fiscal discipline was thus able to act as a complement to the inflation-targeting regime, rather than in any way challenging it. The fact that the monetary authorities will adjust the interest rate whenever the fiscal authorities reduce expenditure, or increase taxes, means that it is possible for the fiscal authorities to undertake 'fiscal consolidation'—that is, debt reduction—without having to be concerned that this might create unemployment. Our simple model thus enables us to see how, in the medium to long run, the NCA framework offers a 'three-for-two' framework: not just inflation control, and the stabilization of output, but the control of budget deficits and debt as well. The lower interest rate—and in an open economy the depreciated exchange rate—which comes from fiscal consolidation will encourage capital accumulation and lead to a higher supply-side potential for the economy.

These features also have striking political economy implications. They mean that, as long as monetary policy is being made in a way which ensures effective stabilization of the economy—and a satisfactory nominal anchor—it will become widely known that fiscal stabilization will lead to more investment and a higher output potential for the economy. Fiscal consolidation is, of course, difficult, in that lower government expenditure creates losers, as do higher taxes. But a political economy in which it is known that fiscal consolidation brings these effects means that there will also be supporters of fiscal consolidation.

What, in reality, was the significance of fiscal policy within the NCA? Clearly, insufficiently disciplined fiscal policy could have caused rising debt ratios and possible instability, or even insolvency for the government. In practice, during the Great Moderation, this did not happen, for several reasons. First, given that policy-makers did not *need* to use fiscal policy, either for inflation control or for output stabilization, political economy arguments supported the view that the role of fiscal policy was to concentrate on 'good housekeeping' rather than stabilization. As a result, most governments had fiscal targets, implicit or explicit, for government debt. Such targets—usually

[41] Barro (1989), following Ricardo, suggested that government bonds were not 'net wealth' and so do not influence aggregate demand. In accounting terms, for the economy as a whole, they are not net wealth, since public debt appears once as a debt and once as a private-sector asset. But for the private sector, bonds, like claims on the capital stock, are part of its net wealth, and are likely to affect spending. The claim that changes in the stock of bonds has no effect comes from an assumption about the effect of the private sector's expectations about future taxes, the discounted value of which will exactly equal the value of the bonds. But this invariance claim will not hold if there are liquidity-constrained individuals or firms, which is what we assume from now on. (See the discussion in AV2.)

[42] In an open economy there will also be implications for the real exchange rate.

asymmetric—included the Maastricht fiscal convergence criteria in Europe and the fiscal rules in the UK; in the US the first term of President Clinton was devoted to reducing the fiscal deficit.

The most important reason, however, why government debt dynamics did not appear to cause trouble, was the nature of Great Moderation itself. Fluctuations in demand, and in inflation, were on the whole small, and contained by monetary policy. Budget deficits and public debt fluctuated, especially as most governments took the view that the 'automatic stabilizers' should be allowed to operate 'over the cycle'. But the resulting variations in budgetary positions were not large enough to really threaten the consensus. Whenever it became necessary to stabilize public debt, that action led to a reduction in interest rates so that expectations which the private sector had held about the interest rate turned out to be wrong. Put more positively, anticipations of fiscal consolidation would lead the private sector to anticipate lower interest rates.

Indeed, very surprisingly, it may be that fiscal consolidation turned out to be so significant that this helped to account for the secular fall in interest rates over the 15 years of the Great Moderation (Allsopp and Glynn, 1999). There has been much discussion of the 'global savings glut' since Bernanke coined that phrase (Bernanke, 2005). There are many reasons for that glut—including the growing levels of saving in emerging market economies and the consequential desire, in those economies and especially in China, for export-led growth. But fiscal consolidation in advanced countries was part of this overall picture.

(iii) The (lack of an) effect of other developments on monetary and fiscal policy

External imbalances

We noted above that external imbalances could have become tangled up in the NCA, but did not. It is interesting to examine why in a little more detail.

The stock-flow effects of external payments imbalances involve essentially the same kind of analysis that we used in describing the effects of fiscal deficits on government debt and private-sector wealth. Instability of foreign debt will emerge in the long run if the exchange rate remains undervalued, or overvalued, but at the same time the monetary authority ensures that resources are fully employed. Confidence in the efficient markets hypothesis led to a view that the exchange rate would—at least eventually—move to a level at which this did not happen. Essentially, this important aspect of policy was left to the foreign exchange markets; an attitude of benign neglect.

Under the NCA the roles of monetary and fiscal policy were closely defined. In the case of the monetary authority (the interest rate setting authority) the role was restricted and did not include, for example, the exchange rate or external imbalances (or internal imbalances, including sectoral imbalances). It was fully recognized that that an inflation-targeting regime could not target inflation *and* the exchange rate. That would have amounted to an incoherent policy reaction function.

The potential role of fiscal policy was also clear. We have noted that, in practice, the period was marked by the fiscal authorities' increasing concern over longer-term fiscal sustainability, often expressed rather simply in terms of targets (implicit or explicit) for budget deficits and government debt. Generally the fiscal authorities were not seen as responsible for the balance of payments or the exchange rate.

We have argued above that fiscal policy affects the exchange rate—and therefore the balance of payments—via the interest rate policy reaction function. A tighter fiscal policy could, in principle, have been used to guide the exchange rate towards the level which would ensure current-account balance in the long run. But by and large, fiscal policy was not used in this way during the Great Moderation.

Nevertheless the external imbalances which emerged during the Great Moderation did not undermine the operation of the NCA regime. This is true even with regard to the very large current account deficit of the US—and the current account surplus of China—which emerged in the early 2000s. Whatever external imbalances existed were, in the end, corrected through exchange rate movements—and associated domestic adjustments in both monetary and fiscal policy—even if these changes and adjustments were considerably delayed (Obstfeld and Rogoff, 2009). That outcome can be compared with what happened in the Bretton Woods system. That system collapsed as a result of an accumulation of external imbalances which could not be corrected within the existing regime. There was no such difficulty during the time of the Great Moderation, essentially because exchange rates were floating.[43]

Private-sector financial imbalances and the vulnerability of the NCA

In the later stages of the Great Moderation, growth in both the US and the UK came to depend to a worrying extent on real estate price rises and private-sector borrowing. There was talk of 'bubbles', and of potential 'busts'. What was happening was that both the personal sector and the financial sector were collateral-constrained. As asset prices rose, borrowing ability rose, enabling both the personal sector and the financial sector to increase the demand for such assets and so raise their price.[44] Such an increase in asset values led to an increase in consumption spending—to a point at which the savings rate in the personal sector in both the US and the UK fell to nearly zero. In our simple model we can think of what was going on as being propelled by a continuing rise in private-sector wealth—not in real wealth but in the money value of that wealth (Bernanke *et al*., 1999; Krugman, 2008).

After the dot-com crash, a large cut in interest rates kept output growing and inflation on track, as we have already described. Widespread financial damage was done by this crash. Some people initially thought that the resulting crash would cause another Great Depression. But this view quickly came to appear mistaken. What seems to have been important in preventing this was that expectations of continuing growth without inflation were sustained, even though this led to further leverage in the financial sector, and further dis-saving by the personal sector. By the time of the next crash, when the GFC led to the Great Recession, things were very different.

There was a glaring gap in the NCA as time drew on into the mid-2000s, namely the inability of the system to limit this leverage-driven expansion in the demand for, and price of, financial assets. Some analysts argued strongly for a policy of 'leaning against the wind' (LATW). This would have involved using interest rates to head off the potential problems—especially problems relating to asset prices, such as the price of housing. But LATW would have meant departing from the established 'monetary policy reaction function' with possibly major effects on private-sector expectations. The consensus view from the US was that the best policy was to tolerate any imbalances (if that is what they were) and to stand ready to sweep up the mess if a bust eventuated. This was exactly what had happened after the dot-com boom in the US.

Essentially, the problem was a lack of instruments. The first best solution would have been for another agency to tackle the issues directly (for example, the increases in house prices). But financial regulators were neither willing nor equipped to do such a job. Such a failure has led naturally to the current proposals for macro-prudential regulation. These have been embodied, in the UK, by a Financial Policy Committee in the Bank of England, which we discuss below.

[43] By contrast there were worries within the euro area where growing current account imbalances had emerged between northern countries and the southern periphery, in a set-up in which exchange rate alteration was not a possible option.

[44] For a simple model of this process, see Krugman (2008). For the classic treatment see Bernanke *et al*. (1999), who treat producers as the leveraged sector. A paper by Luk and Vines (2011) modifies their treatment to make the financial sector the sector with leverage.

IV. The Great Recession and the New Consensus Assignment

This section considers what happened during the Great Recession and its aftermath.

During this period, the action of policy-makers continued to be influenced by the NCA. But, we argue, once interest rates hit the zero bound, the fiscal framework ceased to be adequate in the form which was inherited from the time of the Great Moderation. In particular, the effects of fiscal policy, guided, it might be argued, by the rules and institutional arrangements established within the NCA, became severely damaging.

Our analysis shows that these rules need to be amended and developed. In particular, once a negative shock is large enough to ensure that the zero bound for interest rates is reached, and monetary policy ceases to be able to stabilize the economy, it must become the task of fiscal policy to carry out such stabilization as best it can. Essentially, fiscal policy needs to take over the role previously played by monetary policy in the Great Moderation, and to be seen to be doing so.

We therefore propose a 'split' fiscal policy reaction function which recognizes this need. Such a reaction function would allow—and, indeed, require—fiscal policy to be guided by the rules of sustainability and good housekeeping in normal times when interest rates are above their zero bound, and an interest rate reaction function is capable of stabilizing the economy. But it would also allow—and, indeed, require—that at the zero bound, fiscal policy would play an active role in stimulating demand, so as to steer the economy back towards the full employment of resources. This arrangement is required to reinstate the two-for-one principle—the stabilization of expectations of inflation and of growth at potential—at a time when interest rates are at their zero bound. That principle played an important part in the Great Moderation. Under current conditions, in 2015, it is, of course, the growth part of this principle which needs to be reinstated, not the inflation part, since inflation remains well below target.

(i) The onset of the crisis, the fiscal response, and the NCA

The financial crisis started in the US in the summer of 2007. It was triggered by the subprime market in the United States. *Per se*, that crisis appeared relatively small—for example, relative to the mid-1980s debt crisis (the Latin American debt crisis) (O'Brien, 1986). But it spread rapidly around the world, with banking failures, official bail-outs, and central bank interventions. The reason for the speed of contagion appears to have been the quite extraordinary degree of leverage that had been built up during the Great Moderation.

Nevertheless, despite the obvious seriousness, there was still much confidence in the willingness and ability of policy-makers to intervene and control the economic system. There have been large financial crises before—for example, the international debt crisis of the mid-1980s (Allsopp and Joshi, 1986) and the dot-com crash in 2002—and economic agents appeared to have had confidence that the authorities would 'do whatever it takes' to sustain a regime of full employment and stable prices in which the economy continued to grow. Interest rates had been slashed immediately after the dot-com crash in 2000 and the outcome had been successful; there was a widespread belief that the necessary action would be taken again. One indicator of the continuing confidence was that official and private forecasts for 2009, for the US and for global aggregates, mostly remained highly optimistic even in 2008, in ways which turned out to be very wrong.[45] It was not just forecasters that appeared over-optimistic. For example, oil prices reached their peak of $147 per barrel in July 2008, only a few months before the crisis.

[45] The forecasting errors for 2009 for global growth were close to 3 percentage points for the UN, the IMF, and the World Bank. The outturn for 2009 was –2 per cent year on previous year, as compared with forecasts of about +1 per cent (Hong and Tan, 2014).

The trigger for the Great Recession appears to have been the decision by the US authorities in September 2008 to allow Lehman Brothers to fail (Wolf, 2014). After Lehman, the US economy fell off a cliff.[46] Expectations collapsed; many feared a re-run of the Great Depression. Stock market prices halved and world trade collapsed at a faster rate than in the early stages of that Depression.

However, the world economy did bottom out in the first quarter of 2009, with a relatively sharp recovery into 2010. Nevertheless this recovery petered out in 2010 (Eichengreen and O'Rourke, 2010, 2012). Thus the picture for many advanced countries (and for that group of countries as a whole) was of a step down in the level of output in relation to the previous trend, followed by a resumption of rather anaemic growth.

What accounted for the lower turning point and what was the reason for the resumption of (slow) growth? In this section, we first describe the nature of the shock and then the policy actions which were taken. Outcomes are analysed, with the aid of our simple model, in the section which follows.

The nature of the shock

The nature of the shock which led to the crisis has been discussed in many places. Here we briefly state what we need for the analysis which follows; for a much fuller discussion see Adam and Vines (2009). After the US authorities allowed Lehman Brothers to fail, money and credit markets effectively dried up. The decision by the US authorities to save AIG the next day was not enough, nor was the fumbled passing of the Troubled Asset Relief Program (TARP) legislation in the US Congress, nor the cut of interest rates effectively to the zero lower bound (ZLB). The potential insolvency of much of the financial system led to a firesale of assets, and asset-price falls (Krugman, 2008). This further aggravated the financial sector's solvency problem. What began as a liquidity problem, provoked by the insolvency of a relatively small investment bank, ended up, within weeks, as a solvency problem for much of the financial system in the US. And this spread around the world. The need for action in the UK to save the Royal Bank of Scotland, the Bank of Scotland, and then (later) Lloyds, revealed similar problems; the action was on a similarly massive scale. The difficulties with Europe's banks took somewhat longer to reveal themselves.

This crisis in the financial system affected the rest of the economy in two related ways. First, banks and other financial institutions attempted to rebuild their balance sheets by restricting their lending to the rest of the economy. Second, non-financial firms and the personal sector saw the value of their collateral collapse and decided, on their own account, to borrow less. Furthermore, once expectations about the state of the economy began collapsing, the non-financial private sector wished to save more and invest less for that reason, too.

We use the word 'deleveraging' to describe these actions. Keynes (1936) described recessions as arising from a 'desire for wealth as such'.[47] What began as a desire for liquid assets—in the face of collapsing confidence within the financial sector—quickly turned into a desire by the whole of the

[46] Such a 'tip' into disequilibrium is not unique in the post-war period. The nearest parallel is in the 1974/5 recession that followed the oil price shock at the end of 1973. Only a small recession was being forecast until world trade collapsed in the autumn of 1974—a lag of about 9 months. The proximate cause appears to have been a collapse in trade and the world stock-building cycle. The global economy stabilized in the early months of 1975, at which time government deficits had risen by about 3 per cent of GDP in most OECD countries. In the course of the downturn, stock market prices roughly halved before recovering about half of their fall as it became clear that the economy had bottomed out.

[47] Keynes was worried that a 'desire for wealth as such' would not feed through to interest rate falls and capital accumulation. Hicks's IS/LM system clarified the problem which Keynes identified: with a given money supply, although recession would reduce the transactions demand for money and so lower interest rates, the fall would probably not be big enough. In the framework of the Great Moderation, purposeful management of interest rates was designed to solve Keynes's problem. But at the lower bound, interest rates could no longer be used in this way.

private sector to increase its savings, so as to increase its holdings of wealth. Koo (2009) has described the outcome as a 'balance sheet recession'.[48]

Of course an increase in the desire by the private sector to hold more wealth does nothing to increase the supply of wealth. Instead, it triggers a downward spiral of expenditure reductions. We next describe the policy responses, focusing on what happened to fiscal policy.

Policy responses

First, the US authorities effectively reversed their policy towards financial markets. AIG—a large insurer, especially involved in credit default swaps (CDS)—was bailed out the day after Lehman was allowed to fail. In the next few weeks, the degree of intervention to stabilize financial markets, in the US and elsewhere, was unprecedented. It involved international cooperation to prevent failures of many systemically important financial institutions.

Second, as was to be expected given the inflation-targeting framework, interest rates were slashed, reaching the lower bound in the US by the end of 2008; the UK and the Eurozone were not far behind. This reaction is exactly what was to be expected within the framework of the NCA. It paralleled the action taken after the dot-com crash in 2002. But unlike then, this action was not sufficient to contain the downturn, let alone generate recovery. Once the lower bound was reached, no further offset could be provided by conventional monetary policy.[49]

Third, turning to fiscal policy, in most advanced countries the automatic stabilizers were allowed to operate as the economy fell into recession. This, too, was in line with the framework of the NCA, in which fiscal objectives had typically been formulated as applying 'over the cycle'. Importantly, there was a cooperative agreement to do this at the Washington summit of the G-20 in November 2008. In truth, in most countries, policy-makers had little option owing to the speed of events.

Furthermore, at the London summit of the G-20 which followed in April 2009, there was a significant departure from the fiscal framework of the NCA. Policy-makers were well aware of the potential problems, and that interest rate cuts could not do any more. So they adopted a significant discretionary expansion of their fiscal policies, as a demand-stabilizing measure, to an extent which amounted to perhaps as much as 2 per cent of global GDP over a period of up to three years (Wolf, 2014). This was helpful, but, with hindsight, the extent of the fiscal stimulus was severely inadequate.[50]

At the next G-20 Summit, held at Pittsburgh in September 2009, policy-makers announced that they wished to achieve 'strong, sustainable, and balanced growth', through a cooperative international agreement on a set of policies for the world economy. A monitoring system, known as the G-20 Mutual Assessment Process, or G20MAP, was established, in collaboration with the IMF, to provide accountability for that process of cooperation. Many hoped that the G20MAP would provide the institutional basis for international cooperation in macroeconomic policy-making, including in the settings of fiscal policy (Adam *et al*., 2012, Butler, 2012, Vines, 2015*a,b*).

At the Toronto G-20 summit in June 2010, policy-makers reached agreement on the policies about which they would cooperate: it was agreed that, in advanced economies, policy-makers would

[48] Irving Fischer (1933) used the term 'debt deflation' to describe the similar process which occurred during the Great Depression. Milton Friedman, in his *Monetary History*, focused on the increase in the private sector's demand for liquid assets which happened at that time—and on the error made by the Federal Reserve in allowing banks to fail so that they could not supply these assets. Once we allow for the fact that his analysis was built around a quantity-theory framework, his story is surprisingly similar to that told by Keynes (Friedman and Schwartz, 1963).

[49] Quantitative easing, which has provided a limited exception to this statement, is discussed below.

[50] Budget deficits in the US and the UK and some other countries rose to around 10 per cent GDP, in the way described below.

cooperate in the withdrawal of fiscal support, despite the lack of demand in most countries. Since then, austerity policies have been adopted in the US, the UK, the Eurozone, and, in particular, in Germany. Attending to the growing level of public debt has become the dominant feature in determining fiscal decisions; faced with the very large increases in public debt which had occurred, policy-makers effectively declared 'enough is enough'. This was, to all intents and purposes, a decision to carry out no further discretionary stabilization, and to override the operation of the automatic stabilizers.

We have recounted this potted history to bring out one important point. Fiscal and monetary policy reactions, as the recession developed, were, initially, coherent from the standpoint of the NCA. And they worked; disaster was avoided. But as recovery developed, fiscal practices inherited from the NCA—a concentration on fiscal sustainability and the pursuit of good housekeeping—were put back in place. This was done, even though there was no longer any monetary policy in place of a kind which would help the economy to recover. G-20 Communiques presented the resulting fiscal consolidation as a 'sustainable and balanced' policy, even though there was no policy in place to ensure that the recovery would be 'strong' (IMF, 2015*a*; Vines, 2015*a*,*b*).

Why did this happen? It was claimed that, unless consolidation began, dire things would happen—e.g. a sell-off in the world bond markets and a take-off in inflation.[51] Such predictions have spectacularly failed to materialize. To the extent that the predictions were based on some underlying model—whatever it was—that model has been refuted by the experience of the Great Recession.

We now use our model to give a very simple account of what actually did happen.

(ii) The effect of the fiscal response on macroeconomic outcomes: a simple model

We use our model to analyse the effects of the three aspects of the fiscal policy response identified above. These three aspects were: the operation of the automatic stabilizers, the implementation of a discretionary stimulus, and the reintroduction of fiscal discipline. We consider the role played by unconventional monetary policy in the next section.

The reader is reminded that our model consists of five relationships: the IS curve, the Phillips curve, the interest rate reaction function, the government budget constraint, and the fiscal policy reaction function. It is straightforward to apply this model to the period which has followed the onset of the Great Recession. During this period, inflation has mostly been low and stable—after an initial blip caused by the still-high level of commodity prices—and it is still below target in many countries. So we turn off the Phillips curve. Second, with interest rates at the lower bound, we turn off the interest rate policy reaction function. But the government budget constraint remains in place. And the nature of the fiscal policy reaction function forms the centrepiece of our discussion.[52]

We are left with a simple set-up with effectively just two components. First, we have a rudimentary fix-price Keynesian model. Second, there is a flow-stock-flow relationship between government deficits, government debt, and private-sector expenditure. Roughly speaking, aggregate demand (or

[51] Many seem to have been influenced by Sargent and Wallace's famous article (Sargent and Wallace, 1981) which suggested that there was an (unknown) debt limit and that since the private sector could anticipate hitting it, then by backward induction, deficits would lead to monetization and inflation in the near term. This was always an unhelpful argument. It did not apply to the context when it was written, but it is a really unconvincing argument when an economy is stuck at the lower bound. Monetization of deficits is just what has been done with quantitative easing. It would be desirable if that led to the increased demand that those who worry about inflation are concerned about. Unfortunately it has not.

[52] We continue to ignore the open economy aspects of the problem. Since the shock spread to many countries we can think of any reductions in leakages to imports from the circular slow of income within a country being matched by a fall in the demand for its exports.

the output gap) is influenced by government expenditure and taxes, and the government budget deficit feeds into the stock of government debt, changes in which (gradually) cause changes in private-sector wealth and thus in aggregate demand.

The initial phase and lower turning point

The decrease in private-sector expenditures (coming from the private sector's deleveraging) caused a reduction in the injections into the circular flow of income by the private sector. This shock was very large, even after the reduction in interest rates and other actions.[53]

The model can very simply explain the initial rapid downturn in activity, why it was limited in size, and why there was a subsequent turnaround. All of these things have to do with the role played by the leakages in the form of the automatic stabilizers. These leakages are typically large in advanced countries and are closely correlated with the overall share of taxes on expenditure and income. For illustration we use a figure of 0.5 for the tax rate, τ, which is roughly the figure for advanced countries as a group.[54]

One way of putting the point is the following. The outcome after the workings of the Keynesian multiplier process is that the (*ex post*) size of the private-sector swing to surplus, and the (*ex post*) swing to deficit of the public sector must necessarily be equal (since we are ignoring open economy complications). There is a lot of variation between countries, but in the US, the UK, and some other badly affected countries, budget deficits rose by about 10 per cent of GDP, i.e. by very large numbers.

Our simple model enables us to describe how this happened. After the reduction in injections in the circular flow of income, caused by deleveraging, equilibrium was, we can argue, re-established when the level of income and output had fallen far enough for leakages to fall by an amount equal to the fall in injections. To demonstrate the importance of the automatic stabilizers in the simplest possible way, suppose that the private sector had become so collateral constrained with the onset of the crisis that, as output collapsed, any reductions in private-sector savings, as output fell, induced further reductions in private-sector investment, so that there were in effect no marginal leakages other than to taxes.[55] These assumptions mean that the *only* leakages from the circular flow of income were leakages to taxes. In this case the Keynesian short-run multiplier is equal to $1/\tau$, where τ is the tax rate. Taking the tax rate to be 0.5, the multiplier is 2.[56] And in that case, the *ex post* size of the private-sector swing to surplus, and the *ex post* swing to deficit of the public sector (which are equal but of opposite sign[57])

[53] Koo (2009, 2015), suggests the interest rate effects were overwhelmed in the circumstance of a balance sheet recession. Furthermore the rate of inflation fell, which reduced the fall in real interest rates caused by the fall in nominal interest rates.

[54] See, for example IMF (2015*b*) and OECD (2005). The stabilization coefficient is defined as the effect on the budget deficit (as a proportion of GDP) of a 1 per cent of GDP change in the output gap. In the IMF study, which estimates the degree of stabilization country by country, the median, for the sample of advanced countries, is rather larger than one half—0.77. The study also breaks down the contribution of the automatic stabilizers as compared with the discretionary contribution (which, in the sample, varies a lot). To give a flavour, in the UK stabilization is nearly all due to the automatic component. In the US, the automatic component is much smaller—but the overall degree of stabilization is above the median. This suggests that, in the past, the US has managed to reinforce the automatic stabilizers with discretionary policy. The OECD study, using a different method, reports a coefficient of 0.5 for OECD countries on average. Both studies report a close correlation between the size of the automatic stabilizers and the size of government and, beyond that, suggest that the size of government is a reasonable indicator of the stabilizers.

[55] This corresponds to a highly liquidity-constrained private sector, which seems to have been the case in the initial period after the shock. For reasons explained above, we continue to ignore the open-economy aspects of the problem.

[56] The IMF has argued that the fiscal multiplier is much larger at present than in the normal times (Blanchard and Leigh, 2013; Batini *et al*., 2014). Of course this is because monetary policy was not, as in the Great Moderation, acting to cancel out any fiscal shocks. But it is also because the private sector was not then collateral constrained.

[57] Given the closed economy assumption.

are the *only* leakages, and are exactly equal to the private sector's desire to deleverage. As noted above, in the US, the UK, and some other badly affected countries, budget deficits rose by about 10 per cent of GDP, and the private sector swung into surplus by about the same amount.[58] In this (extreme) case the emergence of the public-sector deficit is the *only* reason that the fall in output was not very, very large—indeed, an unlimited fall.

Of course this story oversimplifies. Reductions in private-sector savings may well have occurred as output fell—i.e. it may be that there was a reduction in the amount by which the private sector desired to deleverage. This might obviously have led to a reduction in leakages and so have played a part in moderating the downfall.[59] As against this, it is clear that much of the private sector did become credit constrained at the time of the crisis. Furthermore, there was a very large fall in private-sector investment coming from a loss in confidence; this worked in the opposite direction by causing a further reduction in injections, further magnifying the downturn. There were clearly many things going on—without a counterfactual, it is hard to know what was really happening. Nevertheless, it is clear that the increase in the public-sector deficit, caused by the operation of the automatic stabilizers, played a very large part in moderating the downturn.

To use Koo's description once more, this was a 'balance sheet recession'. That is, everyone was trying to get out of debt with everyone else. This is, of course, impossible, unless someone else is prepared to go into deficit. The 'someone else' was the public sector.

We make some qualifications to this simple story in section IV(iii) below.

A baseline case: letting the automatic stabilizers operate

The previous paragraphs can be described as a standard short-run Keynesian analysis in which a savings shock is offset by an induced rise in the government deficit. We now extend the analysis through time by assuming a particular fiscal policy reaction function.

In this 'base case' or 'thought experiment', the fiscal rule is simply that the automatic stabilizers are allowed to operate. (Government expenditure is given throughout at its initial level.) Starting from the lower turning point, with recession and a large budget deficit, the initial situation is one where government debt is rising rapidly. But the good news is that the deficit has offset a similar amount of private-sector 'deleveraging'—that is, on average, the private sector has paid off debts or accumulated (net) assets to an extent indicated by the private-sector surplus. To make the example concrete, if the deficit in the first year were 10 per cent of GDP, then by the end of the year, the 'demand for wealth as such' shock has been satisfied by that amount. The effects are cumulative. A 10 per cent budget deficit for 2 years would provide wealth for the private sector equal to 20 per cent of GDP; for 3 years, it would be 30 per cent, and so on.

In fact, as the deficits cumulate, the economy should recover. Our simple model suggests that the economy will *fully* recover. And, with recovery, the induced government deficits should disappear. If the desired increase in wealth by the private sector was 40 per cent of GDP, then the system should home in on a new stock-and-flow equilibrium, with the original level of income and output and government debt higher by 40 per cent of GDP. If the initial shock to the demand for wealth is 'permanent' and unchanging through time—a big if, see below—then the cumulation of the induced deficits equals the initial shock of the excess demand for wealth. This is a story where induced fiscal deficits stabilize the economy and, over time, gradually offset the initial stock disequilibrium.

The big point to make is that even this modest fiscal policy reaction function (essentially the fiscal authorities sit on their hands and wait for recovery) *requires* the authorities to tolerate the induced

[58] In the US and UK GDP did not fall by twice the fall in the public-sector surplus.

[59] Of course this would mean that the private sector's initial desire to deleverage was even greater than 10 per cent of GDP.

government deficits and the build-up of government debt. In the Great Moderation, allowing the stabilizers to operate over the cycle was relatively easy—it was compatible with a target for debt in the medium term, since any increase in public debt could be offset, without jeopardizing full employment, as described in the section on the Great Moderation. But during the Great Recession, long-term fiscal objectives came into stark conflict with the stabilization of output.

There are, of course, other possible explanations of the shape of the recession and the time profile of the build-up of government debt. We consider alternative stories below.

Fiscal activism as an alternative

The first question is whether a fiscal policy of just letting the fiscal stabilizers do their work would be the best possible. This is unlikely. The path of the economy—and its rate of convergence—depends upon the degree of built-in stabilization, which is an accident of history. There have been suggestions that tax and benefit systems should be designed to produce as much additional stabilization as possible (Blanchard *et al*., 2010). But the existing systems were not designed with this in mind.

An ideal *offsetting* policy (if it could be applied) would be large-scale, discretionary, fiscal stimulus immediately after the shock, and, thereafter, whatever size of stimulus was needed to keep the recovery on track. A fully offsetting policy is, of course, not realistic. But since the fiscal deficits described above are temporary—they last only as long as is necessary to inject the required increase in public debt—the sooner such a deficit happens the better.

The discretionary strategy just described, were it to be adopted, would clearly involve a further step away from the framework of the NCA—towards fiscal activism.

Fiscal consolidation and austerity

Finally we can examine the effects of a return to good fiscal housekeeping, i.e. the policies of austerity which have been imposed since 2010. We can speculate that, had governments tried hard from the beginning to avoid public deficits (overriding the stabilizers by a policy of cutting expenditures or raising taxes), then the situation would have been very much worse (see Eichengreen and O'Rourke, 2010, 2012). Indeed, extreme austerity (i.e. a policy of overriding the automatic stabilizers) might well have led to downward instability.

That has been avoided. But there have been episodes of 'fiscal consolidation', for example, following the Toronto G-20 summit meeting. As a result of that action, the recovery in advanced countries, as a group, slowed down into 2012, narrowly missing a 'double dip' in some cases. Austerity continues to guide policy-making in Europe. And there was an attempt by Congress to impose it in the US, with the so-called 'fiscal cliff' put in place for the very end of 2012—largely avoided in the event.

What would happen if austerity were consistently applied? In fact, the reasoning above suggests that it would be hard to make this work. In our simple account, we used the example of a 40 per cent of GDP demand for wealth by the private sector, which we took to be permanent. If that were the case, then offsetting the automatic stabilizers for (say) a year, would just push out the adjustment path for another year or so, without affecting the debt level at which stock equilibrium was regained, or the total amount of below-activity output which would be required.[60] This is very much what has occurred in the UK—debt is still expected to top out at around 80 per cent of GDP (soon). But that has taken longer than initially anticipated (Office for Budget Responsibility, 2010, 2015).

The danger with half-hearted austerity of this kind is that it simply slows the adjustment path. Such a policy is, of course, highly damaging. But there is an additional argument. The best policy, from the point of view of the fiscal authorities seeking to limit deficits and debt, may be fiscal activism and a

[60] There is an exact parallel here with the fact that, with a simple backward-looking Phillips curve, the sacrifice ratio is independent of the speed at which disinflation is carried out. This similarity exists because both the Phillips curve and the government budget constraint act as what control theorists call 'integral controllers'.

large initial deficit, to the extent possible. Such a policy will speed a return to higher activity and growth, and may encourage an earlier return of private-sector investment to its more normal levels. That would mean that it would be possible to begin fiscal consolidation that much sooner. And that the amount of consolidation required would be that much lower.

(iii) Other policies, and alternative explanations of the slow recovery

When the lower bound for interest rates was reached, and fiscal deficits had shot up in major countries, attempts were made to use 'unconventional monetary policy' to spur the recovery, and to avoid the threat of 'deflation' (Ahearne *et al*., 2002). The policy chosen in the US, and later in the UK and other countries, was 'quantitative easing'.

Quantitative easing

Quantitative easing (QE) simply consists of open market operations to alter the composition of the private sector's holdings of assets. In a typical case, the central bank buys government bonds from the private sector (usually from a non-bank financial institution, such as an insurance company or a pension fund) with newly created central bank money. Both base money and broad money rise. As far as the private sector is concerned, holdings of bonds go down, and holdings of money go up; the total of bonds and money does not change due to the (open market) transaction.

The purpose of such QE is to lower yields, for example on long bonds, and to stimulate the economy (via the usual channels, such as investment and consumption). But QE has only worked to a small degree. Japan provides some empirical evidence: that country engaged in QE to try to get out of deflation throughout the 1990s, with apparently poor results (Posen, 1998). There are also theoretical reasons why the outcome appears to have been small. At the lower bound, money and other government paper can be expected to become very close substitutes—there is little difference between a treasury bill paying near zero interest and a bank deposit paying near zero interest. The expectations theory of the yield curve emphasizes arbitrage and has it that long rates are simply based on expected future policy rates (as well as liquidity and/or risk premia). On this view, unless QE affects anticipations about the future behaviour of the central bank—i.e. unless it changes the perceived interest rate reaction function—there should be no effect.[61] Of course, one would expect QE to have effects on bond yields if markets are segmented. But it has proved difficult to demonstrate the existence of such segmentation.

Thus it is hard to test whether QE has been effective and to estimate the effects.[62] But there is, perhaps, some consensus. A number of studies suggest that the first waves of QE lowered long bond rates by about 100 basis points (1 percentage point), both in the US and in the UK. There also appears to be a developing consensus that QE has 'diminishing returns' and that further rounds of QE would, increasingly, have little effect.

QE can be, and has been, used to affect assets and markets other than government bonds.[63] Other interventions of a broadly similar type have been used, including 'credit easing', designed to free up

[61] Part of the problems relates to difficulties about time consistency, similar to those that can arise with 'forward guidance'. The announcement that policy will do something in the future (perhaps conditional on the state of the economy) intended, via expectation, to affect the economy now, may not be credible.

[62] See vol. 28 no. 4 of the *Oxford Review of Economic Policy*, 'Unconventional Monetary Policy', edited by Christopher Bowdler (2012).

[63] For example, in the US, it has been used to buy asset-backed securities (ABS), including mortgage-backed securities (MBS). In the UK and the US, it has been used to support corporate bonds. (The Bank of England has been criticized for not intervening more in the corporate bond market.) In principle, QE could be used in a much wider way, for example to support equity prices. An extreme example of QE was the purchase by the Hong

particular channels or support particular sectors. Examples in the UK include the Funding for Lending programme, and the Help-to-Buy scheme. The general point is that central banks have shown themselves willing to use their balance sheets to offset or ameliorate problems in financial markets—and to try to lower yields, and/or increase asset prices across the economy. Combined with policy interest rates essentially 'stuck' at the lower bound for more than 6 years, monetary policy is about as loose and supportive as it can be.

QE has had an effect both because it has lowered yields and because it has led to an increase in private-sector wealth, as a result of the higher asset prices which have resulted from the lower yields. The effect has been to promote spending, both by lowering the cost of borrowing and by encouraging an increase in spending out of the higher levels of wealth. But QE has not proved strong enough to generate a sustained recovery. We can say, very simply, that if it had been, then public-sector deficits would not have ended up so large. And it not clear why increasing private-sector wealth by means of higher asset prices, as a way of promoting recovery, is preferable to increasing private-sector wealth by running larger budget deficits.

Furthermore, there are obvious negative international repercussions if a number of countries adopt QE at the same time. We know that one of the main ways in which QE works is through causing a depreciation of the exchange rate, since it can lead investors to believe that interest rates will be lower for longer. In fact, it appears that QE leads to rather little demand creation at home and a considerable amount of demand diversion from abroad as the home currency depreciates. When all advanced countries do this together—as has happened—these demand-diversion effects will cancel out. This outcome has been described as 'exchange rate warfare' (Eichengreen, 2013*a*,*b*). The overall result is much less stimulus than if such a policy had been carried out by only one country.

Helicopter money, bond rains, and deflation

Helicopter money and bond rains have sometimes been presented as further alternative possibilities, as has the classic mechanism of deflation. But these ideas add little to the underlying policy choices.

Helicopter money amounts to a budget deficit financed by central bank money.[64] Central banks have, so far, avoided explicit use of this policy. Under present conditions, at the ZLB, there is rather little difference between a helicopter money drop, and a so-called 'bond rain', except that one appears to be monetary and the other fiscal. But this difference is illusory. In the former case, the private sector ends up with more money, and in the latter with more bonds and treasury bills. But at the zero bound there is very little difference between these two things. Either would satisfy a 'demand for wealth as such'.[65] A call for 'helicopter money', or for a bond rain, is essentially a call for fiscal policy to be more relaxed (or less 'austere') so as to supply more of the wealth—in the form of money or bonds—which the private sector wants, rather than something which is in some way an alternative policy.

The classical way out of a recession is 'deflation'. In the simplest model, a sufficient fall in the price level relative to an unchanged 'money supply' would increase the real money supply and raise

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Kong Monetary Authority of $15 billion of stock market assets, during a period of market panic in 1998, brought on by the Asia crisis.

[64] The simplest way to understand this point is to think of the central bank as part of the public sector. Thinking that way enables one to think that a helicopter drop of money is just like a tax cut.

[65] Buiter (2014) draws attention to the difference in accounting conventions for bonds and (high-powered) money. Bonds are a liability of the sovereign (public sector plus central bank). High-powered money is not. His results depend, however, not on this, but on an assumption that the new central bank money is treated by the private sector as irredeemable—which is a commitment device. We doubt that QE has this characteristic, and remain unconvinced that helicopter money would be regarded as permanent, never to be redeemed by future tax rises.

demand—the real balance effect (Patinkin, 1956). In the set-up used here, a deflation—i.e. a fall in prices and wages—would mean that the value of both money and government bonds would rise, and so the level of private-sector (real) wealth would go up; this would tend to stimulate recovery. [66] We have been examining the effect of a shock caused by an increase in the demand for wealth as such: it is clear that—as a comparative static exercise—a sufficient degree of deflation would remove the effects of the shock. However, Keynes and many others have effectively dismissed this argument on the grounds that, during a process of transition, real interest rates would go up, intensifying any recession.[67]

A helicopter drop of money would be a much easier way of getting out of a deflationary situation than requiring price and wage falls.[68] But this, too, is just another argument that more public-sector assets should be supplied to the private sector, by running fiscal deficits.

(iv) The need to encourage investment

It is clear that the problems discussed in this section would begin to go away if investment recovered in the advanced countries of the world. The investment would, of itself, lead to an increase in aggregate demand, strengthening the recovery. But it would also add to the supply of financial assets to the private sector—just as a public-sector deficit does. Such assets created by investment would increase the value of private-sector wealth, and encourage private-sector expenditures by this route. The more that this happened the less would be the need for the kind of expansion in public-sector debt which we have been discussing.

We can learn from history about how this might happen. The Asian financial crisis happened to a large degree because, in the mid-1990s, investors became convinced that the future rate of productivity growth in Asia would be lower, and that investment opportunities would diminish (McKibbin and Vines, 2000). As a result they reduced their level of investment. During the adjustment process, investment fell radically, just as it has fallen in advanced countries since the GFC. Investment, and growth, only recovered again when there had been sufficient currency depreciation to expand export markets and make investment profitable again (especially in the export sector). Since the GFC there has been a global collapse in investment, but the export-led growth adjustment process is not possible for all. There needs to be an expansion of domestic demand in advanced countries of a kind which would take these counties back towards full employment of resources. Our argument has been that investment will not increase sufficiently until there is confidence this will happen. This is the case even though interest rates are very low and unit labour costs have fallen in many countries.

During the Great Moderation there were sound reasons for confidence that policy would make sure that there would be a return to an outcome in the economy in which demand continued to grow. But the collapse in output which happened during the GFC and the consequential slow recovery—which we have used our simple model to analyse—has demolished the confidence of the private sector that full employment without inflation will soon be regained. Furthermore, the policies of austerity have slowed the recovery and have further jeopardized this confidence.

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[66] Notice that any such effect would come from an increase in the real value of both bonds and money. So this is not just a real balance effect: it would apply even in Woodford's cashless economy. (Woodford, 2003).

[67] Tobin (1975) formalized this argument which first appeared in chapter 19 of Keynes's *General Theory.* The idea is very simple. With interest rates fixed at the zero bound, as inflation falls real interest rates rise, leading to further fall in demand. This difficulty can only be avoided if—implausibly—inflation is forward-looking and jumps down, rather than falling gradually.

[68] Keynes also suggested that raising the money supply was a much easier option than deflation. But he appeared to have open market operations in mind—i.e. quantitative easing—which has all of the uncertainties attached to it that we discussed above, rather than the helicopter drop, which the followers of Friedman have advocated.

This is a bad outcome which depends in a crucial way on the policy framework in place. The need for high public debt and ongoing fiscal deficits would be removed if investment recovered. But such a recovery requires confidence that output will recover more rapidly than it has been doing. That will only be possible in the presence of a larger stock of public debt, and if there is a moderation of austerity. If austerity were indeed moderated, demand and output would grow more rapidly, investment would recover, and output would rise, restoring further confidence and further stimulating investment. Fiscal revenues would rise and, since investment was higher, a subsequent move towards fiscal consolidation would become possible. It is, at present, hard to see how a move towards such a favourable self-fulfilling outcome is possible.

We subscribe to the view that, in the absence of a sufficient private-sector response, public investment—especially in needed infrastructure—could be helpful. It would be directly demand-raising. The commitment to such programmes could raise confidence in future growth prospects. Above all, since public-sector assets would be being created, the view that public debt is, *per se*, 'bad' would be challenged. With interest rates at extraordinary low levels, the net position of the public sector could surely be improved. The IMF (2015*b*) has noted that, despite the huge amount of public borrowing since the start of the recession, very little part has been played by public investment, even in countries with well-known deficiencies in public infrastructure, such as the US and the UK.

V. Conclusion: the need for a different fiscal policy reaction function

The Great Recession has lasted about 7 years. There has been some recovery, but little sign in most countries of a sustained move back to faster growth. In the US and the UK there have been signs of restored growth, but few would argue that performance is satisfactory, in that output in both countries is still very significantly below its previous trend growth path (Crafts, 2015). Financial sectors still look fragile, even if less dangerously so than at the height of the crisis.

Policy-makers face a horrible dilemma. They can react to continuing slow growth and recessionary forces by continuing with interest rates near to zero and risking continuing rises in asset prices, or they can use fiscal policy to increase the supply of public-sector assets to offset excess savings in the private sector. They do not like either of these outcomes.

The strongly revealed preference between the two routes to reflation—the monetary route or the fiscal route—has been to rely on monetary policy. Such a choice is fully understandable in the case of the US, where it has never been easy to use fiscal policy. In practice, the initial discretionary fiscal stimulus was too small and taken off too soon. There is little doubt that recovery was delayed with, implicitly, enormous costs.

Elsewhere, such as in the UK, there has been a real possibility of doing something else. The incoming coalition government in 2010 chose 'austerity', reversing the temporary measures introduced by the previous government and adding public expenditure cuts, but largely maintained a policy of letting the automatic stabilizers operate. As we have explained, the consequence was that recession was prolonged and recovery delayed—with, we would argue, relatively little effect on the anticipated peak level of the ratio of government debt to GDP (IMF, 2015*b*; Office for Budget Responsibility, 2015). This is exactly what would be expected to happen if there were a large and persistent deleveraging shock to the private sector, which needed to be offset by low interest rates (at the ZLB) combined with a sufficient and intelligent use of the public sector's balance sheet.

We can put this more succinctly. The *fiscal policy reaction function* was sane initially, but then became dysfunctional. Policy seems to have been concerned initially about the need for fiscal

stimulus to close the output gap. But it swung back to the concerns coming from the NCA, about the build-up of public debt. By contrast, we have argued in this paper that, when interest rates are at their zero bound, the debt build-up should be ignored as an object of policy since (*a*) it is necessary for a recovery of demand and (*b*) can be remedied when other sources of demand—and, in particular, investment—have recovered. At the ZLB, a sensible fiscal reaction function should target inflation and, subject to that, provide as much stabilization of output as possible. That is, it should be just like a monetary policy reaction function: it should target the output gap so long as inflation is under control.

The 'split' fiscal policy reaction function which we are advocating would be demanding to operate, in three ways. First, at times when fiscal policy needs to play an active stabilization role, new competences would be required within the Ministry of Finance. During the Great Moderation, fiscal authorities delegated stabilization and inflation control, together with the institutional counterparts such as forecasting, modelling, and analysis that are needed to participate in the active management of the economy, to the monetary authorities. By contrast, if our proposals were to be adopted, the fiscal authorities would need that capacity in times like the present. Alternatively, support and capacity may need to be provided by the central bank, or by other institutional arrangements, such as fiscal policy councils or committees (see, for example, Wyplosz (2002) and, for a survey of existing institutions, Calmfors and Wren-Lewis (2011)). Second, guidance will need to be provided on when and where the split should operate, and what the 'changeover rules' should be, when such a role for fiscal policy comes to an end and the baton for macroeconomic stabilization is passed back to the monetary authorities. And third, periods in which fiscal policy acts in this way must not damage the stabilization of public debt that fiscal policy is able to bring about in a periods like the Great Moderation—including when such a period arrives again in the future. In such periods fiscal authorities must again be able to attend to fiscal sustainability, and to the management of public debt.

It may be that time will do its work—even without the approach to fiscal policy which we are advocating—and that confidence will begin to revive. But full recovery will not be possible until the private sector begins to invest strongly again, thereby creating the financial assets which the private sector wishes to hold. This has not happened so far because it has not been clear that macroeconomic policy is capable of sustaining the recovery that would make such investment rewarding. We conclude that such a recovery will only be possible if there is a significant change in the macroeconomic policy framework, a change to a regime which contains a new form of fiscal policy reaction function.

Once recovery comes, we subscribe to the view that the objective should be a return to a framework similar to the NCA that was in place during the Great Moderation. When that has happened, fiscal consolidation should be possible without causing damage, and would be appropriate. Policy-makers would know that we have returned to this position when fiscal policy, together with the recovery in private-sector expenditure, had caused a sufficient increase in demand to induce inflationary pressure. As and when that happens, the monetary authorities will begin to raise interest rates again, and we will, once again, enter a world like that we lived in during the Great Moderation. Even then, as we saw in discussing the economics of the Great Moderation, the fiscal authorities will need to be careful not to end up consolidating so fast that they cause interest rates to remain too low, for too long.

Advanced countries clearly face a significant institutional challenge. During the Great Moderation, the fiscal authorities walked away from the short-term management of the economy. Until the recovery from the Great Recession is finally secure, these fiscal authorities need to re-engage with the task of managing the economy in the short-term. They need to understand their obligation to do this, and they need to rebuild their capacity to do this. And the private sector needs to know that they will actually do this.

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