Interactions between sovereign debt management and monetary policy under fiscal dominance and financial instability

Hans J Blommestein and Philip Turner[1]

Abstract

Serious fiscal vulnerabilities arising from many years of high government/GDP ratios have created new and complex interactions between public debt management and monetary policy. Although their formal mandates have not changed, recent balance sheet policies of many central banks have tended to blur the separation of their policies from fiscal policy. The mandates of debt management offices have usually had a microeconomic focus (viz, minimising longer-term borrowing costs, while limiting refunding risks). Such mandates have usually avoided any explicit macroeconomic policy dimension but some major policy overlaps are latent. What is needed is a policy framework for all official actions that affect the maturity structure of government debt in the hands of the public. This requires more analysis of the macroeconomics of government debt management. A full debate about the allocation of functional responsibilities would have to take account not only of the economics, but also of political and institutional constraints. There are operational advantages in having in place appropriate governance arrangements that serve to forestall short-sighted policies and hold specific institutions accountable for their mandates.

Keywords: Monetary policy, central banks, policy design and consistency, policy coordination, debt management, sovereign debt

JEL classification: E52, E58, E61, H63

[1] An earlier version of this paper was presented at the ECB's Public Finance Workshop on "Challenges for Sovereign Debt Management in the EU", held on 7 October 2011 in Frankfurt, Germany. This was also published in the OECD's Working Papers on Sovereign Borrowing Public Debt Management. Emails: Hans.Blommestein@oecd.org and Philip.Turner@bis.org. The views expressed are personal and do not represent the views of the organisations with which the authors are affiliated.

1. Introduction

This paper provides an overview of the growing debate on new and complex interactions between public debt management (PDM), monetary policy and financial instability in conditions of serious fiscal vulnerabilities, higher sovereign risk and considerable uncertainty about future interest rates. As Turner (2011) argues, this creates the spectre of fiscal dominance. These conditions are likely to last for a long time. Although both these interactions and the threat of fiscal dominance were accentuated by the global financial crisis and its aftermath, structural changes in the new financial (and business) landscape may be among the deeper reasons why some of these new complex links are likely to persist.

Unfortunately, our inquiry is hampered by a lack of consensus about the macroeconomics of government debt management, reflected in a very considerable diversity of views on this subject. But the economics profession need to re-focus on this subject and in particular go beyond theoretical frameworks based on debt management neutrality. Until this issue has been more satisfactorily dealt with in the literature and, more generally, better understood by both policymakers and academics, considerable caution needs to be exercised about the policy implications of conditions under which the conventional, microeconomic-focused PDM approach may conflict with wider, macroeconomic considerations. Against this backdrop, the paper raises – in a very tentative way – three issues:

- Whether a broader mandate for PDM is desirable;
- How such a broader mandate might affect potential conflicts with central banks (CBs) that are using their balance sheets on a large scale;
- Whether new functional arrangements between debt managers, central banks and fiscal authorities need to be contemplated, either temporarily or permanently. This involves a review of whether this new complex situation requires a change in what Blommestein and Hubig (2012) term the micro portfolio mandate for debt management. Do new functional arrangements between not only debt managers and central banks, but also fiscal authorities need to be contemplated?

To that end, three (related) principal policy questions will be examined in this paper:

1. Is the current separation between mandates for PDM and monetary policy sufficiently robust to deal effectively with financial stability challenges (including banking crises), deep recessions and risks of fiscal dominance?
2. More specifically, are current institutional arrangements for PDM robust enough to deal effectively with major shifts in policies and/or policy outcomes (possibly leading to conflicts or coordination problems) such as: (a) unconventional monetary policies (quantitative easing (QE); prolonged ultra-low policy rates); (b) large or rapidly increasing budget deficits; and (c) a strong increase in borrowing needs, public debt and sovereign risk?
3. Or should the micro portfolio-based debt management strategy, which aims at maintaining orderly conditions in government debt markets and minimising refunding risks, be supplemented by macroeconomic perspectives on fiscal policy, monetary control and financial stability? For example, should debt managers take explicit account of monetary policy and/or financial stability objectives when designing and implementing debt management strategies? What would be the practical consequences of a macro-based mandate for the (direct) debt management objective of ensuring smooth access to markets, while minimising borrowing cost (subject to an acceptable or desirable level of market risk)? For example, is it necessary that the minimisation of borrowing costs should be subordinate to financial stability considerations during times of extreme market stress? If this is so, would it perhaps be necessary or useful to change the institutional set-up and mandate for debt management offices (DMOs)? Are there (other) macroeconomic

considerations that affect the maturity structure or other dimensions of government debt (eg types of instruments such as inflation-linked versus nominal paper) and that would require some re-thinking about the micro portfolio mandate of DMOs?

The remainder of the paper is organised as follows. A historical perspective on today's policy debate is given in section 2. The separation between PDM and monetary policy is assessed in section 3. Section 4 discusses fiscal dominance and the long-term interest rate. Imperfect asset substitutability across maturities is analysed in section 5. The relationship between the long-term interest rate and financial stability is investigated in section 6. A macroeconomic view of CB operations in government debt markets is given in section 7 and of sovereign debt management in section 8. Section 9 studies the potential for policy conflicts between PDM and monetary policy. The need for a broader (macro) mandate for PDM is discussed in section 10. The final section concludes.

2. An historical perspective on mandates and policy coordination

There is ample evidence that the arrangements for PDM and monetary policy in place before the 2007–08 global crisis were very successful in achieving their stated objectives. In the OECD area (and in an increasing number of emerging markets), there was a consensus view that institutional arrangements for PDM should be based on the following core objectives and functions (Blommestein (2002)):

1. to maintain stable access to financial markets for undertaking the necessary government funding operations;
2. to minimise (over the medium term) government borrowing costs subject to a clearly articulated, preferred level of risk; and
3. to develop liquid government bond markets.

The financial crisis has led to some radical re-thinking about central banking: whilst the pre-eminence of price stability has remained, financial stability objectives (notably those with a systemic dimension) have gained ground.[2] Actual CB operations in many segments of financial markets beyond short-term money markets have become more prominent. As Goodhart (2010) argues, CBs have in some sense returned to their very roots.

This re-thinking of the role of the CB makes necessary a similar re-think about government debt management. The recent crisis has brought to the surface the fact that the *macroeconomic* dimension of government debt management has not had the attention it deserves. This is a difficult and contentious subject. Careful analysis and debate is therefore needed before changing policy frameworks that have worked well. Imprudent changes – or even smaller wrong-headed modifications – would be very risky. It is the quality of the debate among relevant policymakers and the weight of the evidence that should in the end determine whether or not changes in existing arrangements should be contemplated. After all, it is the long-term track record and high quality of the current institutional set-up that created policy credibility in financial markets over many years.

Hard-won policy credibility, in turn, is an important determinant of economic development. More specifically, the quality of PDM and a strong, credible (independent) CB are both most important for economic development. Take the following example from economic history as an illustration. Why did Britain surpass France, a country which had significantly larger

[2] Some analysts argue that financial stability objectives should include the (potential) spillover effects of CB policies on other countries (Eichengreen and Rajan (2011)).

economic resources in the 18th century? In his famous book *The Cash Nexus* (Ferguson (2001)), Niall Ferguson credits the founding of the Bank of England and the notion that British government debt management was better than that of the French:

> *"… after the Glorious Revolution, Britain had representative government, which … reduced the likelihood of default, since the bondholders who had invested in the National Debt were among the interests best represented in Parliament. The National Debt itself was largely funded (long-term) and transparently managed (especially after the advent of the consol). And the Bank of England – which again had no French analogue – also guaranteed the convertibility of the currency into gold (save in an extreme emergency), reducing if not eliminating the risk of default through inflation. It was these institutions which enabled Britain to sustain a much larger debt/GDP ratio than France because they ensured that the interest Britain paid on her debt was substantially less than France paid on hers. If one seeks a fiscal explanation for Britain's ultimate triumph over France in their global contest, it lies here."*

Against this backdrop, let us now take a closer look at the evolution of the separation and coordination of monetary policy and PDM in the OECD area before the global financial crisis.[3] This historical perspective on how separation and coordination arrangements between monetary policy and PDM evolved before the crisis is very instructive for today's debate on: (a) the adequacy of the micro portfolio approach to PDM; (b) the robustness of the separation between monetary policy (CB) and PDM (DMO); and (c) the possible need for different (including more intense) coordination arrangements.

Almost 15 years ago, the OECD and IMF undertook a comprehensive study on separation and coordination arrangements between PDM and monetary policy as part of the design of technical assistance programmes to formerly centrally planned economies (the so-called countries in transition). To that end, a survey was undertaken for the 1995-1996 OECD/IMF Project on the Coordination of Monetary Policy and Public Debt Management, covering 14 countries from both the OECD area and emerging markets.

The resulting report (see Sundararajan et al (1997)) noted that during the mid-1990s, Ministries of Finance (MoF) were in general responsible for most *executive* debt management functions, carried out by specialised units within the ministry (in many cases they were part of a Treasury directorate that also had other tasks in financial management). The CB was often the agent for highly technical activities such as the selling of securities by auction and the settlement of trades. In some countries, however, the CB had a much bigger role in these years, and was initially charged with carrying out the *entire* debt programme (including strategy and operations) as decided by the MoF and the Parliament. The 1997 report judged this institutional set-up as appropriate for the *earlier stages* of developing the framework for monetary management and the infrastructure of local bond markets. It is of interest that a recent central bank study group chaired by Paul Fisher of the Bank of England[4] makes similar policy observations to those made in the OECD/IMF Report from almost 15 years ago:

> *"How [PDM] should relate to macroeconomic policy functions depends on their respective objectives and on economic and financial system circumstances. Economies with deep financial markets have tended to emphasise the separation of [*PDM*] from other policy functions. In developing systems, where, for example, the central bank might also issue debt for sterilisation purposes or manage*

[3] See Blommestein (2011).

[4] The Study Group was created to examine the impact of PDM choices on monetary policy and financial stability under the unprecedented circumstances of the global financial crisis.

government-related cash balances, policy coordination has been more common, including some cases where the central bank is responsible for some [PDM] functions or involved in [PDM] oversight."[5]

But at a later stage of development (when the frameworks for monetary control and for PDM have become more sophisticated), a different institutional structure might further more effectively both monetary policy objectives and debt management objectives. When the CB can readily influence the structure of interest rates by acting only in very short-term interbank markets and when the principal goal of PDM becomes long-term market-based funding based on cost minimisation at a chosen level of risk, the separation of responsibilities becomes the preferred solution. Moreover, the CB's role in developing markets for government securities is much smaller once local capital markets have matured, in many cases supported by an active network of primary dealers, and with commercial banks and the postal system taking over retail selling. With reasonably well-developed financial markets (together with a clear monetary policy mandate), and in "normal" circumstances, the CB's capacity to control the structure of interest rates by moving the policy rate is less dependent on how PDM is being executed.

In such circumstances, shifting the execution of the debt programme to a dedicated unit within the MoF itself, or to a separate DMO with operational autonomy (but under the general supervision of the MoF), would create a better institutional structure for achieving monetary and PDM objectives. Even in such a structure, however, the CB could continue to be responsible for technical tasks such as auctions and settlement. Moreover, this type of co-operative arrangement has been made easier by advances in computer and information technology. Such advances permit the creation and management of sophisticated data bases that are simultaneously accessible by the MoF, Treasury, DMO and CB. As a result, a large number of OECD administrations have transferred the responsibility for the execution of the public debt programme to the MoF and DMOs. The trend of separating the functions between the MoF/DMO and the CB continued throughout the second half of the 1990s.[6]

This "divorce" made their respective roles more distinct. The MoF/DMO could concentrate on financing the fiscal deficit (by minimising financing costs at a given level of risk). The CB plays its part by supporting money market liquidity. Its ready acceptance of government bonds as first-class collateral to support lending to banks is also key.[7] The move in the 1990s to take from CBs the operational responsibility for managing government debt was supported by many policymakers on the grounds of reducing conflicts of interest. The argument was that any mandate for keeping yields on government bonds down (or limiting volatility) could conflict with the monetary policy need to adjust interest rates in the light of changing macroeconomic conditions. Even if the CB resists such a temptation, market perceptions of such a conflict might affect inflation expectations. Another conflict of interest is that advanced knowledge of its interest rate decisions could induce a CB to bring forward bond issuance ahead of raising interest rates.[8]

---

[5] Committee on the Global Financial System (2011). Bank for International Settlements (2000) and Wheeler (2004) make very similar observations.

[6] Separate roles and mandates for central bankers, debt managers and fiscal agencies are also defined (and further clarified) via *medium-term fiscal frameworks* (together with the associated formal fiscal rules) as well as via the publication of (and adherence to) international (transparency) standards. For example, the Code of Good Practices in Monetary and Financial Policies, the Code on Fiscal Transparency and Guidelines concerning Government Borrowing Operations (Blommestein (2004)).

[7] Some CBs started issuing their own short-term notes and became very active in the repo market. In some jurisdictions, CBs have borrowed foreign exchange (in their own name) for their reserves.

[8] Allen (2012) in this volume recounts such an episode in the Serial Funding operation in the United Kingdom in 1951.

By the early 1990s, many OECD countries had created committees for consultation and coordination between MoF and CBs on public debt policy. Such committees (where ministries of planning and legal experts from the ministry of justice could also be represented) proved very effective as platforms for sharing information and for the joint monitoring of the country's overall debt situation (including private external debt). These committees also proved useful in detailing the role of each agency in the execution of the debt programme, resulting in agency agreements about the relationships between MoF, DMOs and CBs as well as a detailed specification of the various functions of debt management performed by each agency.

In the 1990s, then, the operational responsibility of managing government debt was given in more OECD countries to operationally autonomous DMOs.[9] These were given clear objectives (such as the minimisation of expected costs subject to pre-defined risk tolerance limits). There was the widespread adoption of portfolio benchmarks. This realignment of policy frameworks often went together with the independence of CBs with clear inflation mandates.[10] There is no doubt that these market-based reforms helped to make government debt markets work better, and lower long-term borrowing costs for governments. The global financial crisis and its aftermath, however, has created some awkward coordination problems for this separation of policy mandates.

3. How robust is the separation between sovereign debt management and monetary policy?

Tobin's equivalence

The obvious logical difficulty in separating monetary policy and government debt management is well known. It is that both policies involve the sale of official debt – albeit in different forms – to the private sector. Firms and households react as the composition of their portfolios is altered – and such responses have macroeconomic effects.

CBs in effect issue the shortest-duration official debt in their operations to implement monetary policy. From the perspective of portfolio choice, government issuance of short-term debt is like monetary expansion. Tobin (1963) puts this point well:

> *"There is no neat way to distinguish monetary policy from debt management, [both] the Federal Reserve and the Treasury … are engaged in debt management in the broadest sense, and both have powers to influence the whole spectrum of debt. But monetary policy refers particularly to determination of the supply of demand debt, and debt management to determination of the amounts in the long and nonmarketable categories. In between, the quantity of short debt is determined as a residuum."*

Milton Friedman made exactly the same point in his 1959 *Program for Monetary Stability*.

Tobin went on to argue for the use of debt management (ie shifting between short-dated and long-dated paper) as a countercyclical policy to influence private capital formation, and thus real output. His conclusion was that:

---

[9] It is important distinguish *institutional* autonomy (such as that for CBs) from *operational* autonomy (Blommestein (2004)).

[10] The greater power of CBs, and their independence from MoF, itself fed a desire to remove certain non-monetary-policy responsibilities from CBs.

> *"The Federal Reserve cannot make rational decisions of monetary policy without knowing what kind of debt the Treasury intends to issue. The Treasury cannot rationally determine the maturity structure of the interest-bearing debt without knowing how much debt the Federal Reserve intends to monetise."*[11]

He based his analysis on portfolio choice under uncertainty (which he had used in his famous interpretation of Keynes's liquidity preference theory). Official sector sale of assets alters private portfolios, forcing investors to rebalance. No one nowadays disputes his analysis. But portfolio rebalancing effects can take many, quite different, forms – depending on the specific circumstances of time and countries. And, as Zampolli's (2012) review of the literature in this volume makes clear, there are general equilibrium effects that may weaken the partial equilibrium results. Finally, there is much controversy about the size of effects in practice.

The 2007–08 global financial crisis and its aftermath: the path to fiscal dominance

The recent financial crisis has reinforced these traditional questions about the separation between monetary policy and debt management policies. Major CBs have used their balance sheets to drive down the rate of interest of long-term government bonds. The European Central Bank (ECB) has shown the greatest reluctance to buy government bonds: the ECB does not of course have a single government in front of it, but instead many governments of different credit standings. How, then, should we think of the link between monetary policy and debt management policy in the light of these new policies?

To express simply the fundamental links between PDM, monetary policy and fiscal policy, it is instructive to use the consolidated government budget constraint. Defining terms as follows (time is indicated by the subscript t):

D_t = Budget deficit

B_t = Stock of government bonds (ie paper with a maturity greater than one year)

TB_t = Stock of Treasury bills (with a maturity of less than one year)

M_t = Base money

Table 1 is a very simple representation of the financing of the government. Monetary policy refers to the determination of demand debt. The maturity of long-term government bonds is the domain of debt management. But where should we put decisions about Treasury bill issuance? As part of debt management or monetary policy?[12] The shorter the maturity of Treasury bills, the closer they are to "money".

---

[11] His suggestion was that full responsibility for Federal government debt management be assigned to the Federal Reserve, not the US Treasury. One aspect Tobin did not address might be noted: a CB of a monetary area of several independent countries faces a special challenge because there is only one CB but many different governments that decide debt management policy. This is clearly relevant for the euro area.

[12] Historically, the monetary authorities have often expressed their concerns about the impact of the sovereign issuance of very short Treasury bills (T-notes) on the stance of monetary policy. Until the mid-1990s, for instance, the Deutsche Bundesbank took the view that the government should finance itself with medium- and long-term securities only. One compromise solution to potential policy conflicts about this is not only to coordinate the timing and to exchange information on new issuance, but in addition to agree on an issuance ceiling for bills.

Table 1

The government budget constraint and links between fiscal policy, debt management and monetary policy

Fiscal policy		Debt management		Debt management or monetary policy?		Monetary policy
D_t	=	$[B_t - B_{t-1}]$	+	$[TB_t - TB_{t-1}]$	+	$[M_t - M_{t-1}]$

While monetary policy is separated from PDM and fiscal policy, it is recognised that the monetary transmission mechanism may be affected through the impact of the structure of debt on market expectations. Circumstances that entail a risk of "fiscal dominance" (that is, high public debt ratios and heightened sovereign risk weakening the local banking system) can increase uncertainty about future interest rates. This may create expectations of time-inconsistent monetary policies (Sargent and Wallace (1981); Sargent (1993)).

Our focus, although related to this insight, will be more specific. It will be on how particular circumstances of macroeconomic or financial system weaknesses could reduce asset substitutability in financial markets. As asset substitutability across the maturity spectrum declines, conventional CB interest rate policy tools (such as the overnight rate) become less effective and direct CB transactions in bond markets become more effective. The boundary between debt management and monetary policy therefore becomes more and more blurred. This creates a greater need for policy coordination and this may, practically speaking, require a broader interpretation of existing monetary policy or PDM mandates. In other words, the neat-and-tidy separation of policy mandates may not always make for good practical policy.[13] This note considers this issue in a world of fiscal dominance. The arguments summarised here are spelt out more fully in Turner (2011), which contains a number of qualifications to the arguments that follow.

4. Fiscal dominance and the long-term interest rate

New fiscal dominance?

In the OECD area, general government debt increased from 69.8% in 2000 to 73.1% of GDP in 2007 and to an estimated 97.6% of GDP at the end of 2010 (while outstanding sovereign debt is projected to further increase to 105.4% of GDP at the end of 2012).[14] According to BIS estimates of global aggregates, government bonds outstanding amounted to around $44 trillion in 2010, compared with $14.4 trillion at the beginning of 2000. Sovereign debt managers are therefore facing major challenges in managing a massive increase in the global stock of government debt, including huge uncertainty about the size of future budget deficits and their financing. There has been an increase in sovereign risk.

[13] In drawing lessons of the crisis for macroeconomic policies, Reddy (2011) argues cogently that "*the separation of various functions in the public sector to avoid conflict of interest has, to some extent, resulted in ineffectiveness of public policy, particularly in terms of coordination in management of money and finance*".

[14] For G7 countries, the OECD's Economic Outlook shows an increase in general government debt from 77.4% of GDP in 2000 to 80.5% of GDP in 2007 and to a projected 122.3% of GDP at the end of 2012.

The huge rise in sovereign debt by itself is going to have lasting effects on the size and the composition of private sector balance sheets. In addition, there is considerable debate (among academics and policymakers) about the short-term versus long-term impact of fiscal reform measures. As a result, there are major differences of view on how quickly deficits (and sovereign debts) should be reduced to achieve fiscal sustainability. Some would stress deflation risks and others inflation risks. What choices will governments make and how will these influence future rates of inflation? In any event, it is fairly certain that government debt/GDP ratios in major countries will continue to rise, setting the stage for a new period of fiscal dominance.

(i) Perspectives from economic theory and empirical work but no consensus

There is no (academic) consensus about the impact of large government debt on the long-term interest rate. A key question is: how strong are Ricardian effects? Academic studies yield a wide range of estimates. In a world of full Ricardian Equivalence, households increase their savings by the present value of future taxes needed to repay government debt. Their desired bond holdings rise by the exact increase in government debt issuance. The long-term interest rate therefore remains constant.

Another question is whether fiscal dominance or monetary dominance will prevail. If there is fiscal dominance, near-term interest rates would be kept lower than under monetary dominance. But higher expected inflation would drive up nominal interest rates further out. If there is monetary dominance, on the other hand, it would be the reverse. In any case, the issue is more complex than fiscal versus monetary dominance. Faithful adherence to an anti-inflation monetary rule may not by itself be sufficient to ensure price stability – because government policy frameworks may engender fiscal expectations that are inconsistent with stable prices.[15]

In short, there is great uncertainty about the impact of high government debt on future inflation rates and on real interest rates … and thus on the long-term interest rate.

(ii) Destabilising market dynamics?

What precisely this will mean for future interest rate volatility depends in part on market dynamics. Banks have taken leveraged positions in government bonds. The larger interest rate exposures become, and the more dependent they are on leverage, the greater the probability of destabilising dynamics. When expectations about yields change, households with variable rate mortgages, banks and other leveraged investors may all tend to "herd" in their efforts to cut interest rate exposures. Even a temporary bout of financial market volatility can undermine the value of an asset as collateral.[16] This dimension of "collateral capacity" can be crucial for the prices of bonds of crisis-hit countries during periods of market stress.

---

[15] Sargent and Wallace (1981) and Sargent (1993) analyse the unpleasant arithmetic of the government budget constraint in a game of chicken between the monetary and fiscal authorities. This model shows that even when inflation is prima facie a strictly monetary phenomenon, in the longer run inflation is a fiscal phenomenon. Woodford (2000) demonstrated that: "… *even when both fiscal and monetary policy are consistent with … an equilibrium with stable prices (as one possible outcome) … expectations [may] … coordinate upon an equilibrium … in which the price level is determined by expectations regarding the government budget … [even given a] commitment by the central bank to a Taylor rule"*. In a similar spirit, Cochrane (2011) argues that inflation within the new-Keynesian, Taylor rule framework remains indeterminate.

[16] Fostel and Geanakoplos (2008) demonstrate just how important is the impact of collateral practices on demand for non-core financial assets. The "collateral capacity" of an asset depends on its volatility. If this increases (or is expected to increase), the value of an asset as collateral falls much more than its market price because lenders demand larger haircuts of more volatile assets. Leveraged investors will therefore become more inclined to buy assets which they can pledge as collateral with minimum "haircuts" (ie the discount

5. Imperfect asset substitutability across maturities

Uncertainty about future interest rates is important because it determines whether investors regard short-term and long-term paper as close substitutes. In a world of perfect certainty about future short-term rates, debt of different terms would be perfect substitutes for one another. When short-dated and long-dated paper are close substitutes, control of the overnight interest rate is sufficient for CBs to affect the near end of the yield curve.

But uncertainty about the path of future interest rates will make debt of different maturities imperfect substitutes. Because of this, changes in the mix of short-term and long-term bonds offered by the government will change relative prices, and so influence the shape of the yield curve. At the same time, monetary policy based on setting the policy rate becomes less effective as transmission to other interest rates is reduced. Hence CB purchases or sales of bonds become more effective exactly when classic monetary policy – reliant on the overnight rate – works less well.

This perspective is much broader than the special case of the Zero Lower Bound – when the overnight rate cannot be reduced. Even when the policy rate is above zero, imperfect asset substitutability along the yield curve means that monetary policy can be made to work more surely and more rapidly by CB action in longer-dated markets. It therefore applies to policies of monetary restriction as much as to policies of monetary ease. This may become particularly relevant in the years ahead as CBs seek to reduce their bond holdings when government financing needs are still large: the public sector would then be overfunding fiscal deficits.

It may also have been relevant a few years ago. Take the famous "conundrum" of Greenspan. The fall in bond yields in the early phase of Federal Reserve tightening in 2004–05 was seen as weakening the restrictive impact of higher policy rates. But the Fed could have countered this by direct sales of long-term bonds. How effective this would have been in driving yields higher depends on the degree of asset substitutability. It could be argued that a policy of bond sales would have been ineffective given the prevailing sense of interest rate predictability at the time of the "conundrum". At that time, banks were all-too-willing to take huge maturity exposures. But such an argument is not quite decisive – because this very sense of interest rate predictability was itself deliberately nurtured by the Federal Reserve policy of a "measured pace" in increasing the Federal funds rate. The Fed was anxious to avoid a repeat of the bond market collapse that took place around the early 1994 tightening. This predictability itself probably made banks and others increase their leverage – including in interest rate markets – and so kept long-term rates low.

Analysis of this is very difficult. There is no reason to expect the degree of substitutability between assets of different maturities to be constant over time. In addition to the uncertainty about future interest rates created by large government debt, the ability of financial intermediaries to take maturity exposures will also be an important determinant. Collateral requirements on leveraged investors in financial assets will also affect the relative attractions of different assets. All these determinants are likely to change over the cycle. In a crisis, therefore, asset substitutability will fall. This is not only because uncertainty about future interest rates rises. It is also because banks will impose more demanding collateral requirements and will be less able to undertake interest rate arbitrage operations. Such uncertainty and the impaired intermediation capacity of banks were important justifications for the exceptional balance sheet policies that CBs in the major countries followed in the recent crisis.

---

applied to the asset's current market value) to their bankers – and may have to forego buying some assets regarded as underpriced (because their price has become too volatile).

CBs in EMEs, where financial markets are typically thinner, may need to be more interventionist. The domestic investor base is often quite small and dominated by a few large, local banks. This means that local bonds are less reliable as collateral at times of market stress (Fostel and Geanakoplos (2008)). The authorities in several EMEs did indeed directly support local bond markets when they were disrupted in autumn 2008 after the failure of Lehman Brothers. Take the case of Mexico – a country which had followed for many years a policy of financing its debt in domestic currency in local markets. The collapse of confidence in its bond markets led to the following policy measures:

- A shortening of the maturity of new debt issuance;
- Official purchases of long-term government bonds in the market;
- The creation of a CB facility for interest rate swaps which allowed bond holders to reduce their exposure to the long-term interest rate.

The CB could not just reduce the policy rate but had to take direct action to lower the long-term rate in government debt markets.[17]

Policymakers will not find it easy in real time to identify large but temporary shocks that distort investors' portfolio choices. Nor will they be able to quantify the impact on underlying asset substitutability. What often becomes clear in retrospect (eg incipient rises in bond market volatility related to worries about fiscal deficits, difficulties in finding adequate collateral, leveraged positions in interest rate markets holding down long-term yields, etc) will not be so obvious and measurable at the time. The pressure on CBs to act in bond markets will often be framed in terms of countering market volatility.[18] But at what point this could be tantamount to impeding discovery of the underlying market prices will sometimes be hard to judge.

6. The long-term interest rate and financial stability

Policy choices are made yet more difficult by another complication: the importance of the long-term rate for financial stability. It could be dangerous to manipulate the long-term interest rate just for macroeconomic objectives. The potential side-effects on financial stability could be significant. It is the structure of interest rates that creates incentives for the maturity exposures that households and the financial industry choose to take.

The elements of maturity risks are very simple. Savers want their part of their assets to be liquid but real productive investment is longer-term and illiquid. This gap can be bridged by maturity transformation offered by banks, by other financial firms, by markets or by government. The problem is that economic theory does not provide clear guidance about the optimal degree of maturity transformation or about who is best placed to undertake it.

Keynes touched on this issue in his analysis of PDM. His liquidity preference theory suggests that the private sector's willingness to assume liquidity and maturity risks is not well-anchored in fundamentals. Instead it is dominated by cyclical and subjective factors

[17] In addition, other unorthodox policy measures were also adopted. Several EMEs (eg Indonesia, Malaysia and the Philippines) eased mark-to-market rules on banks and other financial institutions holding bonds – especially after the IASB and the accounting rulemakers in the United States had relaxed mark-to-market rules for illiquid assets. The justification is that relaxing such rules can forestall distress selling which could destabilise the whole system.

[18] Justification of such measures may include safeguarding monetary transmission channels.

(such as emotions and spontaneous actions, referred to by Keynes as "animal spirits"[19]). Hence his policy prescription was that government debt issuance should "accommodate the preferences of the public for different maturities".

The analysis by Jean Tirole (2008) of maturity transformation by financial intermediaries with long-term liabilities (such as pension funds and insurance companies) carries this Keynesian tradition further. In the presence of macroeconomic shocks that affect everybody simultaneously, he argues, what is needed is an external risk-free store of long-term value such as government bonds. Echoing Keynes, he writes, "risk-free securities are held because they deliver cash when firms need it: they are liquid in the macroeconomic sense". In effect, he argues for a prudential floor for the real long-term rate of interest. This controversial issue clearly requires more analysis. In any event, CBs cannot ignore the incentives for maturity exposures created by the structure of interest rates. An additional complication is that in some jurisdictions the increased perception of sovereign risk has raised questions about how far domestic government bonds can be considered as "risk-free assets". This is becoming a major challenge for the borrowing strategies of some sovereign debt managers.

7. Macroeconomics of central bank operations in government debt markets

But the main emphasis of Keynes was on the macroeconomic theory. Tily (2010) provides a lucid summary of Keynes's monetary theories. Open market operations in long-term government debt were central to his analysis in his *Treatise on Money* of how to combat slumps. His focus was on the asset side of the CB's balance sheet – not on the liability side. This is very similar to the Federal Reserve's rationale for QE. CB purchases have the aim of improving the markets for paper held as assets on private sector balance sheets. The impact on commercial bank reserves (ie CB liabilities) was not seen as the main element of the transmission mechanism.[20]

Keynes argued for what he called "open market operations to the point of saturation":

> *"My remedy in the event of the obstinate persistence of a slump would consist, therefore, in the purchase of securities by the central bank until the long-term market rate of interest has been brought down to the limiting point."*[21]

He felt that CBs had "always been too nervous hitherto" about such policies, perhaps because under the "influence of crude versions of the quantity theory [of money]". He repeated this analysis in *The General Theory*:

> *"The monetary authority often tends in practice to concentrate upon short-term debts and to leave the price of long-term debts to be influenced by belated and imperfect reactions from the price of short-term debts – though … there is no reason why they need do so."*

One constraint Keynes saw was that a CB acting alone would simply induce capital outflows: he felt the BIS (established in 1930) could encourage internationally coordinated CB efforts

---

[19] Keynes (1936, pp 161–62). See Blommestein (2010) for a discussion of this concept in the context of sovereign risk, borrowing operations and fiscal sustainability.

[20] In the event, excess bank reserves created by QE in the United States just piled up at the Federal Reserve and presumably had a very weak effect, if any, on the demand for goods and services.

[21] Keynes (1930, pp 331–2).

to reduce long-term interest rates. Per Jacobsson, Economic Adviser at the BIS at the time, also strongly supported policies aimed at reducing long-term rates.

Keynes went on to suggest that the "most important practical improvement which can be made in technique of monetary management" would be to replace "the single Bank rate for short-term bills" by "a complex offer by the central bank to buy and sell at stated prices gilt-edged bonds of all maturities".

It was Tobin in the 1960s who developed the theoretical models of how CB operations in long-term debt markets work. This focus was on portfolio rebalancing channels.

- One channel is rebalancing between domestic assets. CB purchases of bonds force lower bond holdings on the private sector. The effect on the yield curve is greater the lower the degree of substitutability between long-dated and short-dated paper.
- Another is the international portfolio rebalancing channel. CB purchases to lower long-term yields should shift portfolio demands from domestic to foreign assets. This should induce currency depreciation, which would reinforce the impact on aggregate demand coming from the domestic rebalancing channel.

Nobody disputes the logic of these portfolio rebalancing effects. The real controversy concerns magnitudes. How large would the macroeconomic impact of more activist debt management policies be in practice? It all depends on the degree of asset substitutability. But this will not be uniform either across countries or over time. The experience of one country will not necessarily be a good guide to what would happen in another country. In a small, open economy the international portfolio rebalancing may dominate the domestic channel. What works in one episode will not necessarily work in another.

Nevertheless, it is not difficult to imagine circumstances in which such policies can be highly effective. In times of crisis, for instance, a large (but temporary) decline in domestic asset substitutability (because of greater macroeconomic uncertainty, banks with weakened balance sheets less able to take interest rate risks, etc) will make activist debt management policies by CBs more effective. When bonds are widely held by foreigners, exchange rate effects may be strong.

History of central bank operations in government debt markets[22]

Keynes was writing in the 1930s. As today, government debt ratios were high – inherited from the First World War. The Bank of England (and other CBs) did cut rates sharply to counter the depression once they had left gold. But the government ignored Keynes's advice to adopt more aggressive CB purchases of debt (or the equivalent change in issuance). Government debt remained long-term: in the mid-1930s, only 3% of bonds had a maturity of less than five years and 86% of bonds had a maturity in excess of 15 years. Susan Howson's 1975 study of British monetary policy in the 1930s found that this limited the effectiveness of the cheap money policy instituted once Britain had left the gold standard. The depression of the 1930s was made worse because debt management policy ran counter to the monetary policy intent of low short-term rates.

In the closing months of World War II, with the UK facing huge government debts, the Treasury set up a *National Debt Enquiry (NDE)*. Keynes, Meade and Robbins were influential members in this Committee. Keynes argued against the "dogma" of financing debt at long maturities. Governments should not "fetter themselves … to a counter-liquidity preference". Instead they should accommodate the preferences of the public for different maturities. He recommended that:

---

[22] Allen (2012) describes the UK's history in this area more fully.

> *"Interest rates [at] different maturities should … pay attention primarily to (a) social considerations in a wide sense; (b) the effects of Government policy on the market for borrowing by the private sector and the problem of controlling the desired rate of investment; and (c) to the burden of interest charges on the Exchequer."*

Note that he mentioned the interest burden to the government last of all – quite the opposite of the current policy focus of DMOs. In any event, the upshot of the NDE was that the policy of "cheap money", which began in the 1930s depression, was reinforced in the post-war period.

It was the Permanent Secretary to the Treasury who drafted the memo, dated 15 May 1945, that summarised the Enquiry's conclusions. He made a point of noting that it took as given Keynes's view that the long-term rate of interest could be controlled by determined official action. The proposed "programme of initial procedure" as he put it – the idea was to adapt this policy in the light of experience – was: "the Treasury bill rate to be brought down to ½% and 5-year bonds to be issued at 1½% and 10-year bonds at 2% to be issued on tap, a new series to be started annually". So Keynes won in 1945 the argument he had lost in the 1930s.

During the 1950s, the proportion of long-dated debt fell steadily. The policy objective became one of holding long-term interest rates down even as growth and investment strengthened. Shorter-term issuance increased. This prompted the *Radcliffe Report* to describe the huge supply of short-dated bonds as "a constant source of embarrassment to the authorities". The aim of maintaining stability in the bond market – not macroeconomic control – had become paramount for the CB. HM Treasury, in its evidence to Radcliffe, made it quite clear that it cared much more about maintaining stability in the bond market than about macroeconomic control:

> *"No attempt is made to use official purchases and sales in the market for the specific purpose of raising or lowering the level of medium and long-term interest rates. … such operations would create market uncertainty and so impair the prospects of continuing official sales of securities … Such operations would involve a serious risk of damage to confidence and to the Government's credit."*

Given that government debt was 130% of GDP, this reluctance to risk triggering bond market instability was understandable. But most of the economists who gave evidence to Radcliffe disagreed with the Treasury. Richard Kahn, Frank Paish, Harry Johnson and others said that the influence of "money" on the long-term interest rate was an important channel in the impact on aggregate demand.

Now the Radcliffe Report is a comprehensive but somewhat diffuse document. But it did conclude with only five main points. Among them a clear statement of the importance of the long-term interest rate as an objective of monetary policy.

> *"There is no doubt that … monetary policy … can … influence the structure of interest rates through the management of the National Debt which … is an instrument of singular potency. In our view debt management has become the fundamental domestic task of the central bank. It is not open to the monetary authorities to be neutral in their handling of this task. They must consciously exercise a positive policy about interest rates, long as well as short."*

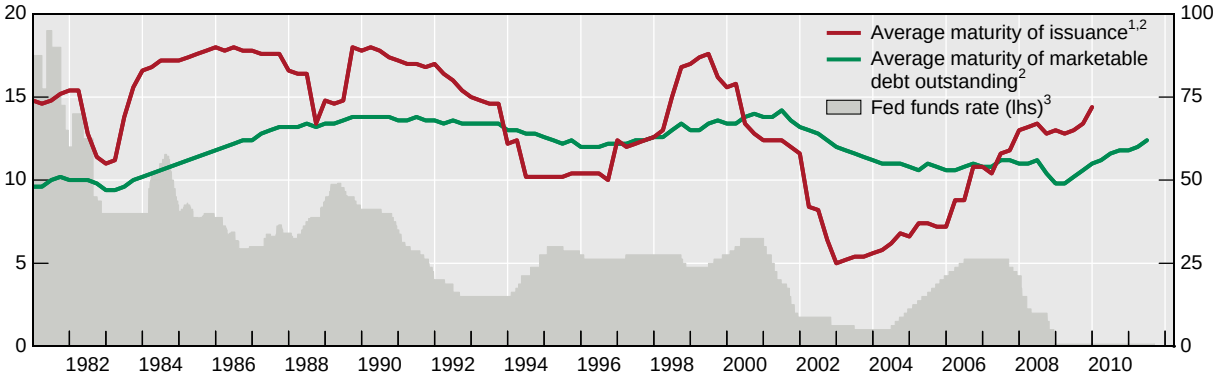
The Report explicitly countered the Treasury view on the need to support by bond market. They argued that greater efforts "to foster greater understanding outside official circles … of the intentions of the authorities would reduce the risk of perverse reactions in the market [from bond sales]".

There have been similar debates in the United States. There was apparently a form of Quantitative Easing in the 1930s,[23] followed by similar efforts to keep long-term rates low during wartime. The United States relied to an increasing extent on shorter-term debt for much of the 1950s and 1960s. A legal ceiling of 4¼% on the rate the Treasury could offer on long-term bonds constrained issuance. As inflation rose, maturities shortened. By January 1976, the average maturity of US government debt reached a low point of only 26 months. But once the 4¼% ceiling had been relaxed, the US Treasury did begin a policy of gradually increasing the average maturity of debt. But by 1980, the average maturity of US government debt was still less than four years (compared with more than 12 years in the United Kingdom[24]).

Graph 1 charts the average maturity of US government debt during the past 30 years – in terms of both the outstanding stock (green line) and issuance (red line). It is striking how large the swings in the average maturity of debt have been.

Graph 1

Maturity of US government bonds



[1] One-year moving average; shown at the end. [2] In months. [3] In per cent.

Sources: Datastream; US Treasury.

This prompts an obvious question: how have these swings been related to macroeconomic policies? To answer this question, a naïve regression was conducted to see how the year-to-year change in the average maturity of bonds outstanding was related to two simple policy variables: the Federal funds rate and the Federal deficit/GDP ratio. The regression was run on annual data over the period 1982 to 2010; it was corrected for first order serial correlation. The Federal deficit as a percentage of GDP, which is not known immediately, is lagged one year. This is shown in equation (a) in Table 2. In a second specification, we replaced the Federal funds rate with the difference between 10-year and federal funds rate to see if average maturity is sensitive to a measure of spread. In a final specification we replaced the deficit/GDP with outstanding debt. Dividing this period into two halves yielded significantly different intercept terms (while the coefficients on the independent variables were not different). This suggests that, irrespective of movements in the independent variables, the average maturity of bonds outstanding tended to fall more rapidly during the first period. To allow for this, a dummy intercept was added (D = 1 for 1982 to 1995 and = 0 for 1996 to 2010).

[23] Anderson (2010).

[24] This relative higher maturity is in part due to a well-developed capitalised pension system where pension funds constitute an important segment of the domestic investor base for government bonds.

All variables in the preferred equation are statistically significant. The simplicity of the regression for equation (a) came as a surprise. This equation provides prima facie evidence that the maturity of outstanding debt is usually shortened when the Federal funds rate is low. This suggests that debt managers deliberately take advantage of unusually low near term market rates to shorten the maturity of issuance when the central bank's policy stance is accommodating. In this sense, debt issuance and monetary policy work in the same direction. The sign on the fiscal variable suggests that a larger fiscal deficit tends to be associated with a lengthening in maturities. Debt managers often say that, following the use of a cost-risk strategy, longer maturities are indeed needed to spread out over longer time periods the higher debt created by fiscal deficits.

The robustness of this finding is confirmed by the results of two other regressions. Using the yield spread, instead of policy rate, does not change the message: the higher the spread the lower is the average debt maturity (equation (b) on Table 4) . The coefficient of spread is about the same size as the Federal funds rate, but, of course, with a negative sign. In addition, the deficit coefficient remained largely unaltered. Using debt instead of deficit produced similar results (the coefficient of the Federal funds rate is only slightly lower than that in equation (a)).

Table 2

Response of average maturity of government debt issuance to macroeconomic variables

	Constant	Fed funds	Deficit/ GDP (–1)	10-year yields – Fed funds	Debt/ GDP (–1)	Adjusted R-squared	F-stat	DW
(a)	–6.209	1.134	103.634			0.63	12.3	1.62
	(3.9)	(4.4)	(4.4)					
(b)	–0.250		104.141			0.55	9.3	1.72
	(0.2)		(3.9)	–1.261				
(c)	–27.036	1.054		(3.709)	34.318	0.42	6.0	1.62
	(3.0)	(3.4)			(3.0)			

Notes: Dependent variable: year-to-year changes in average maturity of outstanding public debt in the United States, in months; t-statistics in brackets. The coeffecients of the dummy variable and the first-order autoregressive term are not reported for brevity.

This empirical link between debt management choices and two simple measures of both fiscal policy and monetary policy suggests that debt management choices have in practice been endogenous with respect to macroeconomic policy – even if debt managers usually claim innocence of macroeconomic policy intent.

In short, there has in the past been quite a strong empirical link between actual debt management choices and two simple measures of both fiscal policy and monetary policy. It provides prima facie evidence that debt management choices in the US at least have been endogenous with respect to macroeconomic policy. Hoogduin et al (2010, 2011) also found that, in the euro area, a steepening in the yield curve leads national debt managers to shorten the duration of their issuance. The key point is that debt management choices do not seem *in practice* to have been independent of monetary policy.

8. Government debt management in a macroeconomic spotlight

Such *prima facie endogeneity* means we need to look more closely at the mandate of the government debt manager. In theory, the mandate could be defined in several ways. At one extreme, the Treasury could, once a year, give its debt manager a maturity objective that is consistent with the government's current macroeconomic objectives. At the other extreme, the mandate could be defined in a way that makes it *exogenous* to macroeconomic policy. The debt manager could be told (eg by the fiscal authority after approval by parliament) to ensure that the average maturity of outstanding debt should always be around y years. DMOs would be told to do this irrespective of the current market configuration of interest rates.

In practice, however, the debt manager is usually given a *micro* portfolio mandate to minimise borrowing costs (debt servicing costs) subject to an explicitly articulated, preferred level of risk. The sovereign borrowing strategy therefore becomes (partly) *endogenous* to monetary developments. The macroeconomic consequences of the (micro portfolio) actions of the debt manager depend (among others) on the prevailing degree of asset substitutability.[25] In normal market (and government borrowing) conditions, the macroeconomic consequences of limited changes to debt maturities would be quite small. But the consequences could be significant in difficult market conditions (often associated with fiscal dominance).

In principle, governments have great latitude to effect significant changes in the maturity of their debt. A government that borrows short-term in its own currency does not need to worry about its refinancing risks in the same way as a private borrower does. This is simply because of its power to tax and issue money.[26] Markets treat government debt differently from private sector debt because government debt "is just a promise to deliver more of its own liabilities … [cash being] simply government liabilities that happen to be non-interest-earning". No private firm can do this. Hence, as Keynes put it, a "counter-liquidity preference has more meaning for the private borrower than for the Exchequer".

There are of course major disadvantages to excessive dependence on short-term domestic currency debt. Budget deficits become more sensitive to changes in short-term rates. When household holdings of short-term government debt rise, the sensitivity of household income to short-term rates increases. This will tend to weaken the effectiveness of changes in policy rates as an instrument to stabilise aggregate demand.

But these considerations do not weaken the case for adjusting issuance maturities in response to exceptional cyclical developments. In fact a government with longer-dated debt at the onset of a crisis is better placed to conduct countercyclical maturity shortening than one which enters a recession with short-duration debt. In a similar way as budget surpluses in good times increase the room for fiscal manoeuvre in bad times!

9. Mandates, accountability and the potential for policy conflicts

As noted in section 2, the setting of monetary policy and the management of government debt were increasingly separated from the late 1990s. Governments became more reluctant

---

[25] Related research focuses in detail on the conditions and assumptions for the micro approach to PDM to be valid. Blommestein and Hubig (2012) show that the removal or weakening of the *risk-free asset condition* and the high degree of *imperfect substitutability* weaken the applicability of the micro approach.

[26] This obviously does not apply to foreign currency debt – nor to countries in a common currency area.

to give CBs the dual mandate of both setting monetary policy and managing government debt so as to avoid (potential) policy conflicts. Trying to keep debt service costs down (or even limiting the volatility of such costs) can conflict with the monetary policy need to adjust interest rates. In many countries, this realignment of policy frameworks went together with stronger institutionally independent CBs with clear anti-inflation mandates and the creation of operationally autonomous public debt offices.

The underlying philosophy was that predictable policy frameworks (for both monetary policy and PDM) should help to stabilise expectations and minimise risk premia. Furthermore, financial markets were assumed to be efficient and only requiring a "light" regulatory touch. It was also reasoned that potential policy conflicts between monetary policy and sovereign debt management could be avoided by following two "separability principles":

- CBs should not operate in the markets for long-dated government debt, but should limit their operations to the bills market.
- Government debt managers should be guided by a micro portfolio approach based on cost minimisation mandates, while keeping the issuance of short-dated debt to a prudent level.

In *normal times*, these institutional arrangements and principles conveniently simplified the lives of policymakers in CBs and DMOs. More importantly, CBs and DMOs were judged as being fairly successful in executing their respective mandates. Moreover, they allowed each institution to be held accountable for distinct mandates. And they provided some insulation from short-term political pressures.

CB activism in debt markets

But recent CB activism in debt markets as a response to the crisis has inevitably undermined these two "separability" principles. A key problem is that QE operations decided by the CB could easily be contradicted by Treasury financing decisions. Remember that the government's balance sheet is much larger in normal times than that of the CB. The CB's balance sheet is more elastic perhaps. But if its policies just induce the opposite reaction of the debt manager (the endogeneity point argued above), its theoretical elasticity will have less practical effect. Remember too the famous "Operation Twist" in the early 1960s.[27] The Federal Reserve used open market operations (to the equivalent of $225 billion when scaled at today's GDP) to flatten the yield curve by shortening the average maturity of Treasury debt.[28] But the US Treasury at that time ultimately lengthened the maturity of its issuance, undermining the Federal Reserve's policy.

And the US Treasury has been lengthening the average maturity of its outstanding debt during recent years. This is (by itself) difficult to square with the rationale of QE, which aims to shorten the maturity of bonds held by the public. It is therefore essential to examine QE in conjunction with debt management policies. To do this, the first table in Tobin's 1963 paper

---

[27] Swanson (2011) argues that earlier studies suggesting that Operation Twist in the 1960s was ineffective do not properly isolate the impact of Operation Twist from countervailing influences. He shows that the programme was successful by lowering longer-term Treasury yields by about 15 basis points. On 21 September 2011, the US Federal Open Market Committee decided on a new Operation Twist involving the purchase, by the end of June 2012, of $400 billion of US Treasury securities with remaining maturities of six years to 30 years and to sell an equal amount of Treasury securities with remaining maturities of three years or less (Federal Reserve press release, 21 September 2011).

[28] Of interest is that Swanson (2011) also shows that Operation Twist and QE2 are similar in magnitude. Therefore it seems reasonable to expect the effects of QE2 to be similar to Operation Twist, with an effect on longer-term Treasury yields of about 15 bps.

was updated – which summarised the structure of Federal government debt in the hands of the public. This provides an illuminating bird's-eye view of the consolidated balance sheet of the Treasury and the CB. This is, of course, a highly stylised characterisation of the monetary impulse of changes in debt maturity … but it is at least a start. This is shown in Table 3.

Table 3

Composition of marketable US Federal government debt held by the public

$ billion

End of fiscal year (Sept)	Marketable securities		Currency & Federal Reserve obligations	Total	Money, Federal Reserve obligations and short-term debt
	(<or = 1 year)	(> 1 year)			
	(a)	(b)	(c)	(d)	= (a+c) % d
1st 2 years of crisis					
2007	955	3474	834	5263	34%
2009	1986	5002	1780	8768	42.9%
	+1031		+946		
3rd year of crisis					
2010[1]	1784	6692	1896	10419	35.5%
	–202		+163		
Latest QE					
2011 June	1529	7785	2659	11973	35%

[1] Using Monthly Statement of the Public Debt of the United States; Federal Reserve Table H.4.1.

Sources: This is an update of that in Tobin (1963) using US Treasury Bulletin; Federal Reserve Flow-of-Funds.

With the adoption of QE after the crisis, reliance on short-term debt and Federal Reserve obligations was increased. Between the end of FY2007 and the end of FY2009, currency and Federal Reserve obligations more than doubled. Short-term marketable securities outstanding also doubled. So an almost $2 trillion expansion in money and short-dated paper. This clearly represented a very significant easing of policy. What might be called "Monetary financing" in the first two years of the crisis went from 34% to 43%. This helped to counter a severe crisis-induced tightening in credit conditions.

But in the third year of the crisis, the maturity of Treasury debt issuance changed in a restrictive direction. Monetary financing actually declined from 43% at end-September 2009 to 36% at end-September 2010. On 3 November 2010, the Federal Reserve announced a special programme to buy around $850 billion in longer-term Treasury securities. This planned purchase took place against a background not only of a substantial expansion in Treasury debt issuance, but also of Treasury policy to lengthen the maturity of its issuance. The need to take account of US Treasury issuance policy is essential to any assessment of

QE. The Treasury had set a policy of lengthening maturity well before QE – a normal response to reduce rollover risks when debt is rising rapidly.

In general, a change to the yield curve induced by CB action may even lead the debt manager to alter its issuance policy to take advantage of what it might view as a temporary interest rate "distortion". Or it may find it can move quickly to attain a maturity-extending objective thanks to favourable market conditions created by the CB. Either way, it could respond *endogenously* to the repricing of debt caused by the CB. This endogeneity is likely to be complex, time-variant and opaque.

The policy tensions between the Treasury and the Federal Reserve have been clear in the recent minutes of the quarterly meeting of the Treasury Borrowing Advisory Committee. On 2 November 2010, for instance, the Committee noted:

> *"Overall, the Committee was comfortable with continuing to extend the average maturity of the debt … The question arose regarding whether the Fed and the Treasury were working at cross purposes … It was pointed out by members of the Committee that the Fed and the Treasury are independent institutions, with two different mandates that might sometimes appear to be in conflict. Members agreed that Treasury should adhere to its mandate of assuring the lowest cost of borrowing over time, regardless of the Fed's monetary policy. A couple of members noted that the Fed was essentially a "large investor" in Treasuries and that the Fed's behaviour was probably transitory. As a result, Treasury should not modify its regular and predictable issuance paradigm to accommodate a single large investor."*

The announcement in September 2011 of a new Operation Twist was significant in that it involved the purchase by the Federal Reserve of longer-maturity debt than under QE2 – and longer than current Treasury issuance. In the absence of Operation Twist, investors would have had to absorb Treasuries with an average maturity of about 7.7 years in the fourth quarter of 2011. With the Fed's purchases, the average maturity of bonds issued to the public falls to about 5.5 years (Ehlers (2012)). One offset, however, will be increased Treasury issuance to replace the shorter-term debt held by the Federal Reserve that will no longer be rolled over.

10. Is a broader (macro) mandate for public debt management needed?

How compelling are then the arguments for revising the conventional (micro portfolio) mandate for PDM? At the OECD Global Debt Forum meeting in January 2011, it was concluded that the global financial and economic crises have led to some blurring of lines between PDM and monetary policy, with DMOs operating extensively at the short end of the yield curve and CBs also at the long end. It was also noted that during these crisis periods, the different mandates appeared sometimes to be in conflict. As noted above, the minutes of the US Treasury Borrowing Advisory Committee have hinted at some tensions.

In addition, it was noted by some debt managers that the mandates of both DMOs and CBs have already become more complex in practice and, as a result, less clear. This raises the question of whether formal (micro portfolio) mandates should perhaps catch up with reality. In any case, there are fundamental or theoretical arguments to question or challenge the micro approach to PDM, including the removal or weakening of the *risk-free asset condition*, and the high degree of *imperfect substitutability* (Blommestein and Hubig, 2011).

Thus far, however, those involved in the policy debate show little appetite for a significantly different *formal* framework for PDM (and/or monetary policy). Clearly, rapidly modifying policy mandates in response to pressures created by an exceptional financial crisis would be a risk.

The debt managers at the OECD Global Debt Forum meeting in January 2011 seem to have supported such policy caution. It was noted, for example, that, despite the deep involvement of DMOs in banking rescue operations during the crisis, there had been no serious deviation from their core (micro) mandate of minimising borrowing costs subject to a preferred risk level.

Yet, in view of the recent financial crisis and danger of fiscal dominance, one can raise the somewhat more practical and specific question of whether debt management should perhaps be an *explicit* part of the macroeconomic triangle: fiscal policy, monetary control (including a financial stability dimension) and debt management strategy (including maintaining orderly government debt markets). This could be done, for example, by making explicit references to monetary policy or financial stability objectives when designing or implementing debt management strategies. An explicit link between PDM and medium-term fiscal policy objectives might be articulated. Or it could be argued that, during times of extreme market stress, the borrowing cost minimisation objective should be (temporarily) subordinate to financial stability considerations. Clear communication channels between debt managers, fiscal authorities, central bankers and financial regulators are important under all circumstances – but they become indispensable during periods of market stress. Against this backdrop, a senior OECD debt manager recently noted that the "neat-and-tidy world of debt management is a thing of the past".

11. Conclusion

The recent financial crisis has stimulated some re-thinking about the monetary policy dimension of PDM. Four conclusions can be briefly stated:

(i) The case for CB transactions in long-term debt markets is stronger whenever there is increased investor uncertainty about the path of future short-term rates. Large government debt increases uncertainty about future inflation. If uncertainty were only about inflation and nominal interest rates, then one answer would be to increase issuance of inflation-linked debt. But the fiscal situation is likely to entail increased uncertainty about real interest rates also. This will reduce the substitutability between short-dated and long-dated paper. In such circumstances, CBs may more efficiently guide markets if they act across the maturity spectrum.

(ii) Very little is known about the empirical magnitudes – either the size of such effects or their stability over time. The recent evidence suggests that CB purchases of government bonds have been effective.[29] But there are grounds for treating the net effects of these operations with considerable caution. Most studies fail to take account of contemporaneous changes to debt management policies which are equivalent to CB transactions in government debt. In addition, there are reasons for thinking that the size of portfolio rebalancing effects – depending as they do on the cyclically sensitive degree of asset substitutability and on the ability of banks to assume interest rate exposures – are likely to vary over time. They will be very hard to predict.

(iii) We need a policy framework for all official actions that affect the maturity structure of government debt for macroeconomic objectives. Without such a framework, even rational policies that economic theory suggests will work may just deepen uncertainty. Markets need to understand what governments or CBs are trying to do.

[29] Table 3 of Turner (2011), page 63, summarises seven recent studies.

They also need to understand the exit strategy. Historically there has been strong official resistance to CBs selling bonds when governments have heavy debts to refinance … particularly when long-term rates are already rising.

(iv) Most DMOs argue that the microeconomic portfolio approach continues to be the most useful policy framework for PDM. Moreover, most (if not all) OECD DMOs speak out in favour of a (continued) functional separation between DMO (PDM) and CB (monetary policy). Sticking to functionally separated mandates is judged, on balance, desirable. DMOs and CBs have different objectives and responsibilities, and each institution is seen as best placed to fulfil their respective functional mandates. A key consideration in this context is that DMOs have a medium-/longer-term operational horizon while that of CBs is often shorter.

Even with well-developed financial markets and a high level of transparency, potential conflicts or tensions between debt managers and monetary policymakers can arise because the government is usually the dominant player in the market. This means that changes in the structure of sovereign borrowing can have a significant impact on interest rates – because DMO operations are large and can have a signalling effect. While sovereign issuers normally act as the biggest player on the supply side, CBs – prompted by the fallout from the global crisis – have been operating as large players on the demand side (as part of quantitative easing operations). For these reasons, consultation and coordination issues assume first order importance.

The jurisdictional sensitivities between different official agencies should not obscure an important but complex issue. The macroeconomic and macro financial context is crucial. The macroeconomics of government debt management (and CB bond purchases) must therefore be better understood. The monetary policy/fiscal policy/debt management linkages were of second order importance when fiscal positions were stronger and fiscal policy frameworks credible. But they cannot be ignored when government debt/GDP ratios will be very high for years. The more complex linkages between PDM, fiscal policy and monetary policy may entail new conflicts of interest and/or of mandates: it is therefore crucial that debt managers, central bankers, and also fiscal policymakers seek a better common understanding of the objectives, functions and institutional arrangements for co-operation and coordination.

This will not be easy. A major stumbling block to policies is simply the lack of a generally accepted theory of the macroeconomics of government debt management. As Missale's (2012) article in this volume makes clear, macroeconomists have been debating this subject for decades.

A common element of the literature on possible macroeconomic objectives is the stabilising or destabilising properties of different debt structures in the face of cyclical movements in GNP or other shocks. In 1998, Barro constructed a model showing that issuing inflation-linked bonds would smooth tax rates in the face of GNP cycles. He also argued that persistent inflation shocks would make long-term nominal bonds more volatile than short-term ones. Hence the government would shift to short-term issues as the volatility of inflation rose. Missale (1999) took a similar perspective. Tax revenues rise with cyclical increases in income (real and inflation). Short-term interest rates are also procyclical. Hence short-term debt ensures tax revenue and interest payments move together. Missale (2012) in this volume summarises the tax-smoothing approach.

Other models have shown how a government can engineer changes in the market value of government debt by market operations to influence the long-term rate. It can do this by altering the maturity of its issuance. In theory, there is no limit to the amount of long-term paper a government can issue in its own currency. At the limit, it could overfund the budget deficit – issue long-dated paper on a massive scale and buy short-term assets from the private sector. One study – cited by Faraglia et al (2010) – found that, given the flatness of the yield curve and its limited volatility, a government following such a strategy would have to hold five or six times GDP in privately issued short bonds and issue similar amounts of long

bonds. It is hardly surprising this is not what happens as Faraglia et al (2008) have shown. The reasons are liquidity and credit constraints. The potential private buyers of government debt face liquidity constraints which prevent them from buying an infinite amount of government bonds. The government has a credit constraint in that it would not want to hold an unlimited amount of risky private assets. The assumption of market completeness is therefore not satisfied. The constraints of market incompleteness would be eased in an open economy; but complications arising from currency mismatches would arise.

Much more thinking about these macroeconomic dimensions is therefore needed. We have argued that PDM cannot in current circumstances be regarded as neutral with respect to monetary policy. Policy mandates may at some point require some cautious adaptation.

References

Allen, William A (2012): "Government debt management and monetary policy in Britain since 1919", this volume.

Anderson, R G (2010): The First US Quantitative Easing: the 1930s, *Economic SYNOPSES*, Federal Reserve Bank of St Louis, Number 17.

Bank for International Settlements (2000): Managing foreign debt and liquidity risks, *BIS Policy Papers No 8.* www.bis.org/publ/plcy08.htm

Blommestein, Hans J (ed), (2002): *Debt Management and Government Securities Markets in the 21st Century*, OECD.

Blommestein, Hans J (2004): "Institutional and Operational Arrangements for the Coordination of Monetary and Public Debt Management", paper presented at the Sixth Annual OECD-World Bank Global Bond Market Forum, held on 24-25 May 2004 at OECD Headquarters (Paris).

Blommestein, Hans J (2010): "Animal spirits" need to be anchored, *Financial Times*, 11 October.

Blommestein, Hans J (2011): Public debt management under fiscal dominance and financial instability, Paper based on presentation at the Second Commonwealth Secretariat Stakeholders' Conference on Debt Management: *Building Resilience in Debt Management - Preserving Debt Sustainability and Financial Stability*, 31 March–1 April, Marlborough House, London. Forthcoming in Conference Proceedings.

Blommestein, Hans J and Anja Hubig (2012): "Is the micro portfolio approach to government debt management still appropriate?", this volume.

Cochrane, John H (2011): "Determinacy and Identification with Taylor Rules", *Journal of Political Economy,* vol 119, no 3.

Committee on the Global Financial System (CGFS) (2011): *Interactions of sovereign debt management with monetary conditions and financial stability*. A report of a Working Group chaired by Paul Fisher. CGFS Papers No 42. www.bis.org/publ/cgfs42.htm

Ehlers, Torsten (2012): "The effectiveness of the Federal Reserve's maturity extension programme – Operation Twist 2: the portfolio rebalancing channel and public debt management", this volume.

Eichengreen, Barry and Raghuram Rajan (2011): "Central banks need a bigger and bolder mandate", *The Financial Times,* 25 October.

Faraglia, Elisa, Albert Marcet and Andrew Scott (2010): "In search of a theory of debt management". *Journal of Monetary Economics* no 57, pp 821–36.

——— (2008): “Fiscal insurance and debt management in OECD economies”. *The Economic Journal* no 118. March. pp 363–86.

Ferguson, Niall (2001): *The cash nexus: money and power in the modern world, 1700–2000*. Allen Lane, Penguin Press.

Fostel, A and J Geanakoplos (2008): “Leverage cycles and the anxious economy”, *American Economic Review*, 98:4, pp 1211-1244.

Friedman, Milton (1959): *A program for monetary stability*. Fordham University Press.

Goodhart, Charles (2010): *The changing role of central banks*. BIS Working Papers no 326. www.bis.org/list/wpapers/index.htm

Hoogduin, Lex, Bahar Öztürk and Peter Wierts (2010, 2011): “Public debt managers’ behaviour: interactions with macro policies”, Banque de France and BETA Workshop New Challenges for Public Debt in Advanced Economies, Strasbourg, 16–17 September 2010; 20th OECD Global Forum on Public Debt Management, 20-21 January, 2011, Paris (Reprinted as DNB Working Paper, no 273).

Howson, Susan (1975): *Domestic monetary management in Britain 1919–38*. University of Cambridge Department of Applied Economics. Occasional Paper No 48.

Keynes, J M (1930): *A Treatise on Money Vol 2,* Volume VI, Collected writings of John Maynard Keynes. Macmillan for the Royal Economic Society.

Keynes, J M (1936): *The General Theory of Employment Interest and Money,* Macmillan.

Missale, Alessandro (2012): “Sovereign debt management and fiscal vulnerabilities”, *this volume*.

Missale, Alessandro (1999): *Public Debt Management*, Oxford University Press, Oxford.

Reddy, Y V (2011): “Special address”, speech to Second Commonwealth Secretariat Stakeholders Conference on Debt Management”, London, 31 March–1 April.

Sargent, T J and N Wallace (1981): “Some unpleasant monetarist arithmetic”, *Federal Reserve Bank of Minneapolis Quarterly Review No 5*.

Sargent, T J (1993): *Rational Expectations and Inflation*, second edition, HarperCollins, New York.

Sundararajan, V P Dattels and H J Blommestein, eds, (1997): *Coordinating public debt and monetary management*, IMF.

Swanson, Eric T (2011): “Let's Twist Again: A High-Frequency Event-Study Analysis of Operation Twist and Its Implications for QE2”, in *Brookings Papers on Economic Activity.* Spring, pp 151–188.

Tily, Geoff (2010): *Keynes betrayed: the General Theory, the rate of interest and ‘Keynesian’ economics*. Palgrave Macmillan.

Tirole, Jean (2008): “Liquidity shortages: theoretical underpinnings”. *Banque de France Financial Stability Review*. February.

Tobin, James (1963): “An essay on the principles of debt management”, *Fiscal and debt management policies*, Prentice-Hall, Reprinted in James Tobin *Essays in Economics: Volume 1* (1971). Markham Publishing Company, Chicago.

Turner, Philip (2011): *Fiscal dominance and the long-term interest rate*. Financial Markets Group, London School of Economics. Special Paper No 199. www2.lse.ac.uk/fmg/workingPapers/specialPapers/home.aspx

Wheeler, Graeme (2004): *Sound practice in government debt management*, World Bank. Washington.

Woodford, Michael (2000): “Fiscal requirements for price stability”, Money, Credit and Banking Lecture. Ohio State University, May. Published also in *Journal of Money, Credit and Banking*, volume 33, no 3 (August 2001) pp 669-728.

Zampolli, Fabrizio (2012): “Sovereign debt management as an instrument of monetary policy: an overview”, this volume.