# Government debt structure and monetary conditions

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*In June 1998 the Bank of England organised a conference on 'Government debt structure and monetary conditions'. The aim of the conference was to discuss the interactions between the size and structure of government debt and the concerns of monetary policy. The proceedings of the conference will be published shortly.*[1] *This article summarises the issues discussed.*

Governments usually play a large role in the money and capital markets, so the needs of government finance often influence conditions in these markets. Until 1997, the Bank of England was responsible, as agent for the government, for both the implementation of monetary policy and the management of the government's debt; hence the Bank had to be aware of any overlaps or conflicts between these two functions. The official responsibilities for debt and monetary policy within the United Kingdom changed after May 1997. The Monetary Policy Committee (MPC) was established within the Bank of England to set the official interest rate, and the Debt Management Office was established by HM Treasury to take over the management of government debt. Despite the removal of the responsibility for debt management from the Bank, it was thought that an understanding of the links between government debt and monetary conditions remained relevant to the monetary policy objectives of the Bank.

There are three main channels through which government debt structure might influence monetary conditions. These are the potential effects of:

- the quantity of debt;
- the composition of debt (eg short versus long-maturity, index-linked versus conventional); and
- the ownership of debt (eg by banks or non-banks).

We discuss each of these in turn.

## Does the quantity of debt matter for the operation of monetary policy?

In a paper presented to the conference, Charles Goodhart[2] argued that practitioners' concerns about the effect of debt on monetary policy need to be judged in a historical context. The absolute size of the government debt in the years immediately after the two world wars—together with the lack of liquidity of financial markets at that time—was the main cause of concern about whether debt management problems could lead to inflationary expansion in the money stock. In the United Kingdom at least, there had been times in the post-war period when it had proved difficult to fund the debt at long maturities on the scale desired, and with sufficient assuredness of timing and volume. Recourse to short-maturity financing was thought at the time to loosen monetary conditions.

But the steady erosion of the debt as a share of GDP and the emergence of a new structure for capital markets after Big Bang[3] reduced the relevance of many of these concerns. New instruments (such as index-linked gilts), new issuing techniques (such as auctions), and new capital market structures all helped to reduce practical concerns about how debt management might impinge on monetary control, to a point where, for the first time since 1913, the two issues are now seen by some as almost entirely distinct.

A different approach was adopted in a paper by Michael Woodford.[4] He attempted to establish theoretically why there might be a link between the quantity of government debt and monetary policy. In his model, the path of the real primary surplus was assumed to be determined exogenously by the government. In this case, he argued, fiscal developments could affect the equilibrium price level through a wealth effect on private consumption. A tax cut not balanced by any expectation of future tax increases would make households perceive themselves to be able to afford more lifetime consumption (if neither prices nor interest rates were to change from their original equilibrium values). The excess demand caused by the tax cut would drive up prices, until the consequent fall in the real value of household wealth reduced demand.

In Woodford's model, the composition of the public debt affects monetary conditions. The shorter the average

(1) '*Government debt structure and monetary conditions*', K. Alec Chrystal (ed), Bank of England, December 1999. This publication will be available from Publications Group, Bank of England; telephone 020–7601 4030.
(2) London School of Economics and MPC member, Bank of England.
(3) Reforms of the London securities markets in 1986 that changed the trading systems and market access rules. See, for example, 'City regulation after Big Bang', *Bank of England Quarterly Bulletin*, March 1986, pages 71–73.
(4) Princeton University.

duration of nominal debt or the greater the degree of indexation of the government portfolio, the more inflation would need to increase by to reduce the value of the public debt enough to restore equilibrium following an expansionary fiscal shock.

But this analysis proved controversial. At a theoretical level, Willem Buiter[1] argued that equilibria of the type discussed by Woodford were logically impossible. And Matt Canzoneri[2] offered empirical evidence aimed at distinguishing between the world in which Woodford's analysis might apply and one where more conventional monetary forces would operate. Mervyn King[3] argued that there was no way of distinguishing empirically between an equilibrium where a tax cut was not balanced by any expectation of future tax increases and an equilibrium where a tax cut was balanced by the expectation of a tax increase in the distant future.

### Does the composition of debt matter for monetary policy?

Two aspects of this question were discussed.

First, what incentives for monetary policy arise from the maturity structure of the debt? One existing view is that the monetary authorities have an incentive to keep interest rates low when there is a large stock of short-maturity debt, in order to reduce roll-over costs (ie the costs of refinancing the debt). However, Alessandro Missale[4] provided some evidence to support the view that monetary authorities sometimes react more aggressively to inflationary shocks when the maturity structure is short. His theoretical rationalisation for this result was that, when inflation is persistent, the monetary authorities need to react more aggressively in order to minimise the future roll-over costs resulting from higher expected inflation and higher future nominal interest rates.

Second, does the government's decision to issue short versus long-maturity debt, or conventional versus index-linked debt, affect real yields and thus interest rate sensitive sectors of the economy? The magnitude of such effects depends on how closely different types of government debt instruments can be substituted for one another. Gregory Hess[5] addressed this issue. His findings for the United Kingdom showed that the government's public debt management had a statistically significant effect on expected rates of return on different types of government security. These effects were found to be small, but this could be because there were no substantial changes in debt composition in the sample period. His results suggested, however, that these effects could be larger during periods when there was more uncertainty about the direction of monetary policy.

### Does it matter if banks hold government debt?

The central policy question in this session was whether the impact of debt sales on monetary conditions was different if debt was held by banks or non-banks. Ken Kuttner and Cara Lown[6] addressed this question in an empirical paper using mainly US data. Their results suggested that increased debt issuance could lead to an increase in bank holdings of debt. In addition, they found evidence that bank holdings of debt displaced lending to the non-bank private sector, and that banks with larger debt holdings tended to continue lending at a faster rate following a policy tightening than banks with smaller debt holdings.

According to Kuttner and Lown, new issues of debt taken up by banks were a substitute for loans to the private sector, and therefore reduced the supply of bank credit to the private sector. So the debt held by banks had a buffer stock function. Large holdings of debt affected the transmission mechanism of monetary policy, because banks could continue lending in the face of monetary tightening by running down their holdings of debt. However, this was not the effect that might have been expected from one traditional UK perspective, which is that debt sales to banks lead to an increase in (broad) money and are, therefore, expansionary.[7]

It was unclear whether the US evidence was relevant to the United Kingdom, as it was derived from a cross-section of banks in the United States. Alec Chrystal provided some empirical evidence for the United Kingdom, which was consistent with the view that neither debt sales in general, nor debt sales to banks, had had any detectable positive impact on either money supply growth or bank lending. Such evidence as there was seemed to point to debt sales to banks having a negative effect on the money stock. This may be explained, however, by the pre-1993 government funding rules by which sales of gilts to banks were not counted as 'funding' (so further debt issues, of equivalent value to banks' purchases, would be sold to the non-bank private sector in order to meet annual funding targets).

Anil Kashyap[8] argued that for debt structure to matter there would have to be some imperfection in financial markets that violated the Modigliani-Miller theorem for banks themselves, and hence created demand from banks for government debt to act as a buffer stock against unforeseen deposit withdrawals. But the empirical evidence presented would be unconvincing until economists had a clearer theoretical insight into why government debt might be a

(1) Cambridge University and MPC member, Bank of England.
(2) Georgetown University.
(3) Deputy Governor, Bank of England.
(4) University of Brescia.
(5) Cambridge University.
(6) Federal Reserve Bank of New York.
(7) The change in M4 is identically equal to the public sector net cash requirement, minus debt sales to non-banks, plus sterling lending to the non-bank private sector, plus net externals, minus net non-deposit liabilities of banks. Debt sales to banks increase M4 one-for-one, only if all other items in this identity remain unchanged. If, for example, bank lending to the non-bank private sector falls by an amount equal to the rise in debt sales to banks, then M4 will remain unchanged.
(8) University of Chicago.

better buffer stock than private debt, and why the maturity of the debt affected its value as a buffer stock.

## Panel discussion

Ben Friedman[1] suggested drawing together the range of ideas discussed at the conference into three broad sets of issues. The first—associated with, for example, the work of Michael Woodford—concerned government solvency and the extent to which the aggregate government debt could be thought of as having net value. While this set of issues was interesting analytically, Friedman argued that it was not of particular relevance to economic policy makers now in either the United States or the United Kingdom, given the improvement in the fiscal position observed in both countries over the past few years.

The second set of issues was whether the composition of the debt could affect the central bank's ability to control money. This could occur for one of two reasons. First, a large fraction of the debt in the form of short-term liquid instruments might impair the central bank's ability to restrict money supply growth. Second, if highly liquid debt were a good substitute for money, a large fraction of the debt held short term could, everything else constant, reduce the demand for money. If the monetary growth target were non-inflationary in a world where debt was not liquid, this reduction in the demand for money would imply positive inflation, even if the central bank managed to limit money growth to its target.

Both reasons implied that an increase in the proportion of short-maturity debt could have inflationary consequences if the central bank were following a monetary targeting rule. Even if the central bank were not operating an explicit money growth rule, it was important to take account of both effects to optimise money's role as a possible leading indicator.

The third question was whether, in an interest rate setting regime, debt management policy might affect the level of the interest rate consistent with achieving the central bank's monetary policy objectives. Friedman argued that, qualitatively, the answer was that it might do so. One result of the standard theory of behaviour under risk was that the entire range of expected asset yields depended on the supplies of all the assets that together make up the market portfolio. And many elements of macroeconomic activity depended on these asset returns.

Friedman argued that the size of such effects was larger than was supposed by many others, but accepted that the consensus was that these effects were not, in practice, large. So while the optimal level of short-term interest rates was affected by debt management policy, the strength of this relationship was probably dwarfed by the scale of movements in short rates that most central banks implement in the course of a typical business cycle, or in response to a normal range of shocks.

Finally, Friedman raised another question that he believed the monetary authorities should consider: what implications did changes in debt management policy have for monetary policy via their impact on the microstructure of financial markets? For example, the growth since the 1970s of the volume outstanding of long-maturity US government bonds had been closely matched by the evolution of futures and options markets on those bonds. This evolution in market structure had in turn promoted the development of more sophisticated risk-management techniques. Similarly, the development of the US index-linked bond market might herald the development in the United States of index-linked pension and life-assurance policies, which may eventually have important implications for long-run consumption and savings decisions.

Philippe Moutot[2] discussed some of the implications of debt management policy for the European Central Bank (ECB), and drew out three main themes. The first was institutional. As was clear from, for example, Charles Goodhart's paper, the relevance of public debt policy to monetary policy depended partly on the institutional framework and level of development of financial markets. So to what extent did the institutional framework for monetary and fiscal policy within EMU deal with the interactions discussed at the conference? Moutot pointed to three potentially important institutional features. First, Article 104 of the Maastricht Treaty prohibited monetary financing of national authorities' fiscal deficits. Second, the Growth and Stability Pact placed limits on the size of fiscal deficits. And third, the independence of the ECB and its objective of price stability gave it a first-mover advantage in its dealings with national debt management authorities.

The second question was the extent to which debt management might affect monetary conditions within the euro area. Moutot agreed with Friedman that there would probably be some, albeit small, effect, but that this would need further research by ECB staff.

The third question was whether preparations were adequate for implementing an ECB monetary strategy. At the time, both monetary targeting and inflation targeting were being considered. But whatever strategy was adopted would be applied flexibly in the short term. The ECB was also aiming to be in a position to offer an independent assessment of fiscal deficits and public debt, and it recognised the importance of developing adequate statistics on financial conditions within the euro area.

Mervyn King agreed with Ben Friedman that one of the main themes to have arisen from the papers presented at the conference was that, in today's liquid markets, monetary policy can largely be separated from debt management. But to what extent did this judgment depend upon current theoretical considerations? There may be many aspects of both the transmission mechanism and optimal debt management that were not yet well understood by economists. Charles Goodhart's paper clearly described the

(1) Harvard University.
(2) European Central Bank.

concern of anyone within a central bank that policy should be robust to a variety of assumptions or models about the way the world worked. That was why, in practice, central bankers felt nervous if they observed rapid growth in monetary aggregates following changes in debt management policy, even if they were not following a money targeting regime. So there was a need to monitor monetary aggregates carefully.

In addition, King pointed out that a complete theoretical framework for determining optimal debt management does not exist. Debt management should consider the trade-off between the cost and risk of the debt structure. However, much work remained to be done in modelling these risks and how the structure of the debt affects them. For example, it was not clear why, in practice, index-linked debt does not play a more substantial role in the debt management policies of developed countries. Even in the United Kingdom—home to the most developed index-linked debt market—index-linked debt had not been the most important source of debt issuance. This suggested that there remains a gap between the theory and practice of debt issuance. If theory were to catch up with the practical questions faced by policy-makers, there would perhaps be implications for monetary policy which were not yet evident from the theory.

Another issue arising from the academic literature was the validity of empirical testing. King pointed out that most of the papers discussed at the conference raised problems of identification. It might never be possible to distinguish between the different types of equilibria discussed in Michael Woodford's paper. It was not clear if firm conclusions could be drawn from the empirical results discussed by Alessandro Missale: the inflation process could affect the maturity of the debt that the public was willing to hold. But in turn, the size and structure of the debt could affect the inflation process that the government chose to implement.

Finally, Mervyn King noted how curious it was that there had been little discussion of debt management and monetary conditions after the start of EMU. Maybe this was because it simply will not matter for the ECB. And yet it was clear that it represented a risk, because debt management was a policy for national governments on which the ECB had no role. The recognition of the potential interaction between monetary policy and debt management had led to the introduction of restrictions on governments' fiscal positions via the Stability and Growth Pact. But these restrictions do not apply to either the maturity structure of the debt or the degree of its indexation.

## Conclusions

What conclusions could be drawn about the effects of government debt structure on monetary conditions? Taking in turn each of the three channels through which government debt structure might influence monetary conditions:

- *Effects of the quantity of debt*. The consensus at the conference was that the insights of Michael Woodford were interesting but controversial and, as pointed out by Ben Friedman, were not of great current relevance to the UK conjuncture. Rather, as Charles Goodhart argued, new financial instruments, new issuing techniques and new capital market structures since the 1980s have all helped to reduce concerns about how the quantity of debt impinges on monetary control, to the point where the two issues could now be seen as almost distinct.

- *Effects of the composition of the debt*. Changes in the composition of debt might affect expected asset returns and the incentives facing the central bank. But the consensus at the conference appeared to be that the size of these effects was small, at least in response to marginal shifts in government portfolios. There was nevertheless a need for monetary policy makers to monitor changes in the composition in the debt portfolio carefully, to be alert to possible effects on the monetary aggregates.

- *Effects from the ownership of debt*. Most of the work on this topic has been done on the United States, where there were suggestions (for instance in the work of Kuttner and Lown) that government debt taken up by banks was a substitute for loans to the private sector. For the United Kingdom, the available evidence was consistent with the view that debt sales to banks had only a small impact on either money supply growth or bank lending. But little detailed empirical work has been done to support this result. So that view can, at most, be tentative.

Overall, therefore, the economic research discussed at the conference suggested that changes in debt management policy at the margin were unlikely to have first-order effects upon monetary conditions in normal circumstances. But two important caveats are needed. First, many aspects of the transmission mechanism and optimal debt management are not well understood, and policy should aim to be robust to a variety of different assumptions and models. Second, there are few, if any, examples of extreme changes by governments in debt management policy. So it is less clear that large changes in the quantity or composition of the debt will not have implications for monetary conditions. For these reasons, the effects of changes in debt management policy on monetary aggregates need to be monitored and interpreted with care.