THE POLITICAL ECONOMY OF CENTRAL BANKING IN HIGH- AND LOW-DEBT COUNTRIES

Stephanie A. Bell

Assistant Professor, University of Missouri-Kansas City and
Research Associate, Center for Full Employment and Price Stability

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1. INTRODUCTION

After decades (if not centuries) of attention, there remains scant agreement on many fundamental issues regarding monetary policy. Historically, the more hotly-contested battles have centered on the issue of "rules" versus "discretion" – especially between Monetarists and Keynesians. But aside from the battles over the relative merits of short- versus long-term policy objectives (i.e. fine-tuning versus maintaining price stability and fiscal balance), the mainstream has generally agreed that monetary easing will, in the short-run, have expansionary effects, while tightening will prove contractionary at the macro level.[1] This paper challenges that common ground, arguing that when the government debt is large, and a significant portion of it is short-term or interest-variable, monetary easing (tightening) may well have contractionary (expansionary) effects, leading to perverse macro outcomes.

Thus, our central question is whether raising (lowering) the interest rate is recessionary or expansionary. Our proposition is that it depends crucially upon the size, sectoral distribution and maturity of the government's outstanding debt. The question of whether the mix of public debt has any impact on the real economy through interest rate channels has recently been debated by an impressive cast of policymakers and academics (Chrystal, 1998). Our paper addresses the subject matter of these debates, but it does so with reference to the work of Hyman Minsky, whose financial insights were not part of these recent discussions. Specifically, we consider Minsky's income, balance sheet and portfolio channels. We conclude with an empirical look at the relation between public debt structures and monetary policy outcomes in ten OECD countries.

2. THE IMPACT OF PUBLIC SPENDING AND PUBLIC DEBT ON THE ECONOMY

We begin by recognizing that any national government's spending can be divided into four categories: (1) government employment and spending on government production (e.g. military personnel and the postal service); (2) government contracts (e.g. Halliburton, Lockeed Martin, etc.); (3) transfer payments (e.g. Social Security, Medicare, etc.); and (4) interest on the government debt (Minsky, 1986). Since the purpose of this paper is to examine the conditions under which rising (falling) interest rates may stimulate (contract) the economy, due to their impact on fiscal expenditure, we will focus our attention on the fourth category of government spending. To see how increased spending on debt service ultimately affects macro outcomes, we must consider the three channels through which public debt and interest expenditure affect our economy: the income and employment channel, the budget channel and the portfolio channel.

2.1 The Income and Employment Channel

The first and most obvious way that government spending affects the economy is by its impact on output and employment. When governments purchase goods and services from the private sector or issue contracts to private firms, there is a direct effect on income and employment.[2] In contrast, when governments transfer income to people, this has no direct effect on the economy. The economic impact comes only as the recipient – the unemployed, the elderly or the infirmed – spends the funds that the government has

[1] Exceptions include New Classical models in which monetary policy is fully anticipated as well as Real Business Cycle models where monetary policy has no short-run effects on the real economy.

[2] There is also a secondary, or multiplier, effect. The impact of government spending through the income and employment channel is examined in any standard macro textbook.

transferred to them. In this sense, the interest-income received by holders of public debt is no different from unemployment insurance, Social Security or Medicare; it is a form of government spending (i.e. a transfer payment) that affects income and employment only indirectly, as the recipients of these transfers purchase newly produced goods and services.

2.2 The Budget Channel

The rules of accounting dictate that the financial positions (i.e. surpluses and deficits) of all economic units must sum to zero. This simple truth follows from the fact that whenever a unit tenders money in payment for current output, some other unit receives a monetary payment. And, since we can consolidate units according to aggregate payments made and received, this proposition also holds true at the sectoral level (i.e. across households, business firms, government and foreigners).[3] Thus, if the government spends $50 billion more than it collects in taxes, the sum of the surpluses and deficits across all other sectors must result in a $50 billion surplus.[4] Combining households and business firms (bank and non-bank firms) into a unified private sector, Equation 1 shows the familiar sectoral relation at the macro level.

Private Sector Surplus = Public Sector Deficit + Balance of Payment Surplus [1]

Incorporating these interdependencies, we see that when the federal government increases its expenditure on debt service – e.g. because it is forced to roll over maturing

[3] These sectoral relations are emphasized in the work of Michael Kalecki (1971).
[4] The household sector's budget position reflects the difference between disposable personal income and personal outlays. The business sector deficit is the excess of plant and equipment, inventory and corporate housing investment over business internal funds

obligations at higher interest rates – the addition to the federal budget deficit must translate into an additional surplus elsewhere.[5] Thus, the budget channel shows how income flows are affected by the government's budgetary stance, which is itself affected by the central bank's stance.

2.3 The Portfolio Channel

The portfolio channel and the budget channel are interrelated in that every federal budget deficit (surplus) implies the addition (absorption) of government securities to (from) the portfolios of households, commercial banks, credit unions, private pension funds, nonfinancial corporations, insurance companies, etc.[6] Once issued, holders of these government bonds benefit from the fact that they are: (1) free of default risk[7]; (2) highly liquid; and (3) able to store financing power for their holders. But the liquidity and financing power of a given portfolio depends not only on the *volume* of assets it contains but also on the *value* of those assets at any given time. And the central bank's interest rate policy can alter both.

As we have seen, central bank tightening can increase the outstanding *volume* of government securities, as higher deficits result in greater debt issuance. But they will also diminish the *value* of existing debt, since bond values vary inversely with interest rates.

(where internal funds = retained earnings plus capital consumption allowances). And, the foreign sector balance reflects changes in a nation's net acquisition of foreign assets.

[5] Similarly, monetary easing might allow bonds to be rolled over at lower interest rates, thereby reducing fiscal deficits and, hence, diminishing the private sector surplus.

[6] The portfolio effect was emphasized by Brainerd and Tobin (1968) as well as Minsky (1986).

[7] As long as governments issue debt denominated in a sovereign currency – i.e. one that can be created and destroyed at will – financial markets should not attach default risk to these issues. Marketability is ultimately guaranteed by the central bank, which furnishes liquidity by buying government bonds.

In the former case, an increase in the central bank's short rate will increase the volume of new debt issues, thereby increasing the flow of income to new bondholders. In contrast, increases in longer-term interest rates will diminish the stock value of longer-term securities, perhaps reducing expenditure via the wealth effect. If the volume effect dominates the value effect, contractionary policy may well be expansionary at the macro level.

3. THE IMPACT OF CHANGING INTEREST RATES: A RANGE OF POSSIBLE MACRO EFFECTS

Conventional theory, which "focuses only on the direct and secondary [i.e. multiplier] effects of government spending," masks the "much more powerful and pervasive" effects that work through the budget and portfolio implications of macro policy (Minsky, 1986, p. 21). Together, the income, budget and portfolio effects help us to think about the various channels through which the issuance and servicing of government debt affects private sector incomes and balance sheets. And it is only through a consideration of these stock and flow channels that we can begin to think about the conditions under which central bank policy, though its effect on incomes, balance sheets and portfolios, can produce macro outcomes that run afoul of the conventional wisdom. But this proposition requires further investigation. In order for monetary tightening to belie conventional theory, any negative interest rate effects – e.g. declining investment expenditure, a worsening of the current account, increased financial fragility or an adverse wealth effect – must be dominated by positive interest rate effects – e.g. increased spending and lending induced by income, budget and portfolio effects. We now turn to an examination of these opposing effects.

3.1 *Negative Interest Rate Effects*

According to mainstream economic theory, rising (declining) interest rates should adversely (favorably) affect the macro economy through two important channels: (1) the supply and demand for credit; and (2) relative demand for foreign (versus domestic) goods and services.[8] Thus, when the central bank takes a contractionary stance, it becomes more costly for banks to *supply* credit – given that it will now be more expensive for banks to acquire the reserves that must be held against newly created deposits.[9] Similarly, higher interest rates should, *ceteris paribus*, reduce the *demand* for bank credit – given the assumed (inverse) relationship between the quantity of credit demanded and the price of credit. Simply put, then, tight money policy should discourage bank lending as well as private sector demand – especially from the business sector – for credit-financed spending.[10]

Additionally, interest rate movements are thought to drive short-run movements in the (spot) exchange rate, which is then supposed to impact relative prices and, hence, current account balances. Figure 1 shows this standard, short-run result in its simplest graphical form. Here, central bank restraint causes the real money supply to contract (shifting M/P to M'/P), which places upward pressure on the interest rate (moving the

[8] We are using the term "negative" in a relational rather than a normative way. We mean simply that there is a negative or inverse relation between the interest rate and the level of economic activity. Thus, if output declines as interest rates increase, one observes the negative interest rate effect.

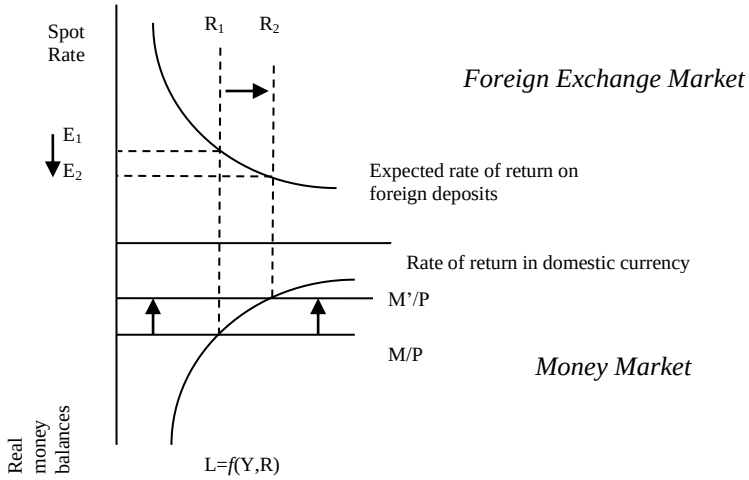
[9] When banks are not legally required to hold reserves (e.g. in Canada or the United Kingdom), an increase in the interest rate paid on member banks' clearing balances is supposed to discourage an expansion in the supply of credit by raising opportunity costs.

[10] While the interest rate is occasionally introduced as an independent variable in the consumption function, macro theory continues to emphasize investment spending when referring to the mechanism through which monetary policy affects macro outcomes.

equilibrium interest rate from R_1 to R_2), and generating imbalance in the foreign exchange market.

FIGURE 1

Short-Run Effect of Contractionary Monetary Policy



To return the foreign exchange market to equilibrium, the domestic currency must appreciate (i.e. the spot rate falls from E_1 to E_2) as investors attempt to increase their domestic currency holdings. As this is a short-run analysis, the real exchange rate $q = EP^*/P$ also appreciates (since domestic (P) and foreign (P^*) prices cannot readily adjust). Finally, assuming the Marshall-Lerner conditions hold, a real appreciation of the domestic currency should lead to a worsening of the home country's current account.[11]

Thus, according to standard, mainstream theory, monetary tightening should reduce aggregate output as the business sector responds to rising interest rates by reducing its demand for credit-financed capital expenditures. Moreover, the negative effect of declining investment should be exacerbated by the exchange rate effect, which

[11] The Marshall-Lerner conditions refer to relative elasticities and require the volume effect to outweigh the value effect of the goods and services that continue to be imported and exported. A discussion of value and volume effects can be found in any International Finance text, for example Krugman and Obstfeld (1997).

presumes that rising interest rates will appreciate the domestic currency, causing a further drag on GDP as residents substitute relatively cheap imports for domestically produced goods and services. Thus, conventional theory predicts that the macro economy will be adversely affected by contractionary monetary policy as (at least) two of the four components of aggregate demand – investment and net exports – decline in response to rising interest rates.

An alternative way to conceive of negative interest rate effects emanates from outside the purview of mainstream theory – from the work of H.P. Minsky. Minsky emphasized the complexity of the financial system as well as the tendency for firms to finance investment and ownership of the stock of capital assets. As firms borrow to finance positions in capital assets, a contractual cash flow is established. However, as Minsky is famous for noting, serious problems can arise when the contractual outflows cannot be met with available cash inflows.[12]

He identified three types of positions that financing units can take: hedge, speculative and Ponzi. Each position is characterized by different relations between contractual cash flow commitments on debt and expected cash receipts earned by capital assets (quasi-rents)[13] or cash due to be paid on financial assets. As long as anticipated cash inflows (quasi-rents or payments due on financial assets) are expected to be more than sufficient to meet contractual payment commitments (now and in the future), Minsky characterized the unit's position as "hedge". In contract, when a unit expects its cash inflows (from operating assets or from owning financial claims) to be less than its

[12] We are, of course, referring to Minsky's well-known financial instability hypothesis (FIH). The above discussion lays out the hypothesis only superficially. For a fuller treatment, see Minsky (1986) or Papadimitriou and Wray (2003).
[13] References to the term quasi-rents can be found in Alfred Marshall and J.M. Keynes.

cash payment commitments during some immediate (but relatively short) period, Minsky characterized the unit's position as "speculative". A firm that engages in speculative finance can meet its interest obligation using current and expected cash inflows, but it cannot retire maturing debt as it comes due (i.e. it cannot meet its principal payment using current and anticipated inflows). It must, therefore, roll over its maturing debt. Finally, Minsky described a "Ponzi" unit as one whose actual and expected cash inflow is insufficient even to pay interest on its outstanding obligations (i.e. its current financing costs exceed its current income). Such a unit is forced to capitalize its interest by increasing its total indebtedness.

Since hedge units will fulfill their obligations independent of financial market considerations, the central bank's interest rate policy cannot undermine their secure positions. They are vulnerable only to the extent that quasi-rents fall below expected levels.[14] Speculative and Ponzi units are also susceptible to economic developments that reduce quasi-rents, but they face a sort of double-jeopardy in that they are also vulnerable to developments in financial markets. This is because speculative and Ponzi units must roll over or increase debt, which means that rising interest rates will increase the cash-flow commitments of these units without increasing their prospective receipts, thereby narrowing their margins of safety even further. Thus, if rising interest rates result in a reversal of the present value relations necessary to maintain the current pace of

[14] A shortfall in quasi-rents can occur because of a rising cost structure or a drop off in revenues.

investment[15], then it is easy to see how a deterioration of the financial environment (e.g. through tight monetary policy) can undermine an economic boom.

Another way to conceive of a negative interest rate effect is to consider the way in which rising rates work through the portfolio channel. If long-term rates increase along with short rates, the value of longer-dated bonds will decline. This *could* induce reductions in aggregate expenditure, as bondholders respond negatively to a decline in their wealth holdings. Ultimately, however, the strength of the wealth effect is likely to depend upon the distribution of government debt, for, as Goodhart (1999) noted, the wealth effect will probably be small when the bulk of the longer-dated government debt is held by long-term institutional investors, insurance companies and pension funds. Under such circumstances, the "transmission mechanism between changes in short rates of interest and in expenditures" may diminish to the point of "second-order importance at best" (1999, p. 70).

In sum, both mainstream and non-mainstream theory can accommodate negative interest rate effects. The primary difference is that the former accepts the rising-interest-rate-declining-GDP relation as a theoretical norm, while the latter makes it contingent on the current mix of hedge, speculative and Ponzi units in the economy.

3.2 Positive Interest Rate Effects

Many non-mainstream economists have argued that if the conventional wisdom regarding interest rate effects is not robust – i.e. if rising interest rates are not predictably associated with declining investment and an worsening of the current account – then monetary

[15] The profitability of any investment depends upon the relation between the present value of the expected quasi-rents and full cost of the project. A project is financially feasible only if the former exceeds the latter.

policy can yield *unexpected* macro outcomes (i.e. rising rates might have little or no effect on GDP.) Our aim is to push the inquiry one step further, seeking the conditions under which a far more peculiar outcome might occur. Specifically, we are interested in a truly *perverse* interest rate effect, one in which GDP *rises* with monetary *restraint* or *contracts* with central bank *easing*. With this in mind, we proceed by hypothesizing that when the government's debt is large, appropriately distributed and sufficiently short-dated in its maturity, rising (declining) interest rates can be expansionary (contractionary), due to income, budget and portfolio effects.[16] Below, we provide some preliminary evidence to support our hypothesis.[17]

When monetary authorities adjust short-term interest rates, the impact on fiscal expenditures can be large. This is especially true when interest payments are variable (e.g. indexed) or when there is a large proportion of short-term debt that must be rolled over at the new rate. In the event that policy is contractionary, bonds will be rolled over at higher rates of interest. But interest rate policy will also affect asset values and the liquidity of portfolios. At the end of the day, the spending and lending propensities of those with relatively large public debt holdings may determine the policy outcome.

As Table 1 reveals, public debt holdings differ widely across nations.[18]

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[16] The question of whether the size and composition of public debt is relevant for monetary policy decisions was taken up at a conference organized by the Bank of England in June 1998. The proceedings were published by the Bank of England (1998).
[17] The research undertaken for this project marks only the first phase of what is sure to become part of an on-going research project. As more data becomes available and the scope of the study broadens, the robustness of our findings must also be held to account.
[18] Following Minsky (1986), the acquisition of government debt by the government bodies (e.g. central bank, government agencies and government-sponsored agencies) and by foreigners has been subtracted from the total issued to derive private domestic acquisition.

TABLE 1

A Sample Distribution of Government Debt

	Australia				
	1992	1994	1996	1998	2000
Households	33%	34%	45%	51%	49%
Non-Financial Corporations	5%	6%	1%	0%	0%
State & Local Governments	2%	4%	3%	2%	2%
Total Non-Financial Sector	40%	45%	50%	54%	51%
Commonwealth Bank Group	3%	1%	0%	4%	6%
Other Banks	42%	33%	28%	18%	19%
Money Market Dealers	4%	7%	3%	0%	0%
Insurance Companies	5%	9%	12%	14%	12%
Private Pension Funds	1%	1%	0%	0%	0%
Other Financial	5%	5%	7%	10%	12%
Total Financial Sectors	60%	55%	50%	46%	49%
Total Domestic Sectors	100%	100%	100%	100%	100%

Source: Reserve Bank of Australia (http://www.rba.gov.au/)

	UK				
	1992	1994	1996	1998	2000
Individuals & Private Trusts	10%	7%	5%	6%	12%
Public Corporations & Local Governments	0%	0%	1%	1%	2%
Other	10%	13%	11%	6%	1%
Total Non-Financial Sector	20%	20%	17%	13%	15%
UK Banks	8%	10%	10%	6%	3%
Building Societies	3%	3%	3%	0%	0%
Insurance	43%	44%	44%	47%	46%
Pension Funds	25%	21%	25%	31%	34%
Investment & Unit Trusts	1%	2%	1%	2%	2%
Total Financial Sector	80%	80%	83%	87%	85%
Total Domestic Sector	100%	100%	100%	100%	100%

Source: Bank of England (http://www.bankofengland.co.uk/Links/setframe.html)

	Belgium				
	1992	1994	1996	1998	2000
Individuals	14%	7%	3%	7%	8%
Non-Financial corporations	2%	2%	3%	4%	3%
Total Non-Financial Sector	16%	9%	6%	11%	12%
Financial institutions	84%	91%	94%	89%	88%
Total Domestic Sectors	100%	100%	100%	100%	100%

Source: Die Oesterreichische Nationalbank (http://www.oenb.co.at/)

Italy			
	1996	1998	2000
Households	49%	31%	29%
Non-Financial Corporations	2%	2%	2%
Local Governments	0%	0%	0%
Total Non-Financial	52%	33%	31%
Monetary Financial Institutions	32%	31%	33%
Insurance & Pensions	7%	11%	15%
Financial Auxiliaries	0%	0%	1%
Other Financial Intermediaries	9%	25%	21%
Total Financial Sector	48%	67%	69%
Total Domestic Sector	100%	100%	100%

Source: Bank of Italy (http://www.bancaditalia.it/)

Japan					
	1992	1994	1996	1998	2000
Households	4%	4%	4%	3%	3%
Non-Financial Corporations	0%	0%	1%	0%	0%
Local Governments	0%	0%	0%	0%	0%
Total Non-Financial Sector	5%	5%	5%	3%	4%
Depository Institutions	37%	39%	36%	35%	38%
Insurance and Pensions	11%	18%	25%	25%	26%
Other Financial Intermediaries	48%	38%	34%	37%	33%
Total Financial Sector	95%	95%	95%	97%	96%
Total Domestic Sector	100%	100%	100%	100%	100%

Source: Bank of Japan (http://www.boj.or.jp/en/)

USA					
	1992	1994	1996	1998	2000
Households	28%	34%	37%	35%	34%
Non-Financial Corporations	4%	4%	5%	4%	4%
State & Local Governments	19%	15%	11%	13%	14%
Total Non-Financial	51%	53%	52%	52%	52%
Commercial Banking	14%	12%	11%	11%	11%
Savings Institutions	2%	1%	1%	1%	0%
Credit Unions	1%	1%	1%	1%	0%
Pension Funds	5%	5%	5%	4%	4%
Insurance	9%	10%	9%	7%	6%
Mutual Funds	9%	8%	9%	12%	12%
State & Local Govt. Ret. Funds	9%	9%	11%	13%	13%
Total Financial	49%	47%	48%	48%	48%
Total Domestic Sector	100%	100%	100%	100%	100%

Source: Board of Governors of the Federal Reserve System (http://www.federalreserve.gov/)

In the United Kingdom, Belgium, Italy, and Japan, for example, the financial sector holds the vast majority all of domestically held public debt. In contrast, the non-financial sector holds a majority of the total debt in Australia and the United States. This can be highly significant for, as Goodhart (1999) recently argued, the distribution may affect the manner in which the central bank's interest rate policy ultimately affects the real economy.

Looking more closely at the distribution of debt holdings within the non-financial sector, we see that non-financial corporations hold an extremely small fraction of total government debt. Indeed, they hold no public debt at all in Australia or Japan and only a small share elsewhere.[19] This means that the remaining portion of the public debt held by the non-financial sector must be held either by individuals/households or state/local governments. Looking again at Table 1, we find holdings among state/local governments to be rather unimportant (except in the US, where state and local governments hold 14% of the total). Thus, in every country examined above, the bulk of the debt held by the non-financial sector is held by individuals/households.

As holders of government bonds, the central bank's interest rate policy affects the volume of interest income received by households with adjustable-rate or maturing bonds. For example, if the monetary authority pushes up interest rates, then the flow of interest income to households will increase, which should induce some additional consumption spending (given the simple Keynesian consumption function). But as noted above, the change in interest rates will also affect the stock value of assets already in

[19] Holdings are actually highest in the United States, where non-financial corporations hold just 4% of the total.

portfolios.[20] Thus, if in addition to the above-described income effect, households also respond to changes in the value of public debt, then monetary policy might also affect aggregate consumption through a portfolio (or wealth) effect.[21] If income and portfolio effects are *both* operable, then monetary outcomes may depend crucially on the *maturity* of the outstanding debt, as opposed to merely its distribution. This is because contractionary policy will raise interest expenditure by a larger amount when a relatively large share of the outstanding debt is short-term or interest variable. When this is the case, rising interest rates may induce a positive interest rate effect (i.e. increased consumption expenditure through the income effect). If the composition of debt is heavily skewed toward the longer end of the maturity spectrum, however, an increase in short-term interest rates will tend to reduce longer-term bond prices, thereby inducing a negative interest rate effect (i.e. decreased consumption expenditure through the portfolio or wealth effect).

Finally, turning to the financial sector, we see that in modern economies with complex financial systems, surplus units (e.g. households) indirectly finance deficit units (e.g. governments) by acquiring the liabilities of financial institutions. Today, for example, surplus units acquire the liabilities of financial institutions such as banks, pension funds, insurance companies, savings institutions, etc., which themselves become the direct holders of government debt. Consequently, much of the direct impact of the

[20] It was reasonable to treat consumption as a simple function of disposable income in the early part of the 20th century, when household wealth and consumer credit were relatively unimportant. But household wealth and consumer credit have become important factors, which now serve to attenuate passive consumption behavior (Minsky, 1986).
[21] Goodhart (1998) examined the likelihood of a wealth effect in the United Kingdom, focusing on the impact of interest rate movements on equities and foreign exchange.

central bank's interest rate policy will be on the assets acquired and sold by financial institutions.

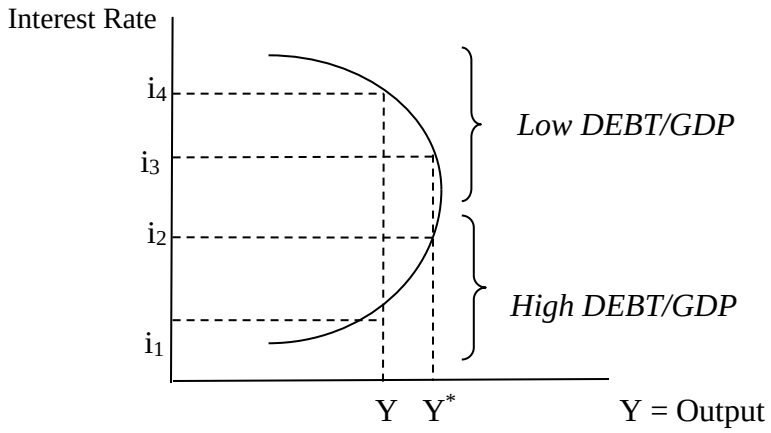
We are accustomed to thinking in terms of the negative effects of contractionary monetary policy, especially with respect to its impact on the financial sector. But it might also be possible for financial institutions to reap some *benefit* from a restrictive monetary stance. If, for example, these institutions hold sizable quantities of short- relative to longer-term debt, the additional flow of interest income they receive as maturing obligations are rolled over may significantly mitigate the negative effects due to increased borrowing costs and capital losses on longer-term holdings. When this is the case, margins of safety may remain robust enough to prevent banks from tightening credit requirements. Kuttner and Lown (1999) found that "banks with larger debt holdings tended to continue lending at a faster rate following a policy tightening than banks with smaller debt holdings" (p. 5). Thus, private sector spending and lending may continue unabated, even as the monetary authority attempts to apply the brakes.

4. THE RELATION OF PUBLIC DEBT TO MONETARY POLICY OUTCOMES

As we have argued above, the conventional outcomes associated with restrictive/expansionary central bank policy may be frustrated by opposing forces, driven by income, balance sheet and portfolio effects. Initially, we hypothesized that the government's debt would have to be large and comprised of a sizable percentage of short-term issues in order for monetary policy to yield perverse macro effects. Figure 2 provides a graphical representation of our logic.[22]

[22] Figure 2 presumes that the requisite mix of short- and long-term debt exists.

FIGURE 2 *The Monetary Policy Outcomes Curve*



Here, we see that monetary policy will have the predicted outcome when debt-to-GDP levels are low.[23] For example, when interest rates increase from i_3 to i_4, output declines from Y^* to Y. In contrast, contractionary policy will have expansionary effects when debt-to-GDP ratios are high. In this case, an increase in interest rates, say from i_1 to i_2, will result in an increase in GDP from Y to Y^*.

We now attempt to determine whether there is any evidence to support the hypothesis that perverse monetary policy outcomes are more likely in high-debt countries than in low-debt countries. Table 2 shows the debt classifications of the 10 OECD countries in our sample.

[23] For lack of a more sensible alternative, we use the Maastricht criteria to define high- and low-debt countries. See Buiter et al. (1993) for a discussion of the arbitrary nature of the Maastricht deficit-to-GDP and debt-to-GDP limits.

TABLE 2 *Debt Classification Using Maastricht Debt Criteria*

	Average Debt-to-GDP Ratio (1990-2002)	Classification Using 60% Maastricht Criteria
Australia	30.6%	Low
Austria	64.2%	**High**
Belgium	124.1%	**High**
France	58.7%	Low
Italy	127.0%	**High**
Japan	99.5%	**High**
Luxembourg	5.5%	Low
Netherlands	69.3%	**High**
United Kingdom	54.1%	Low
United States	68.6%	**High**

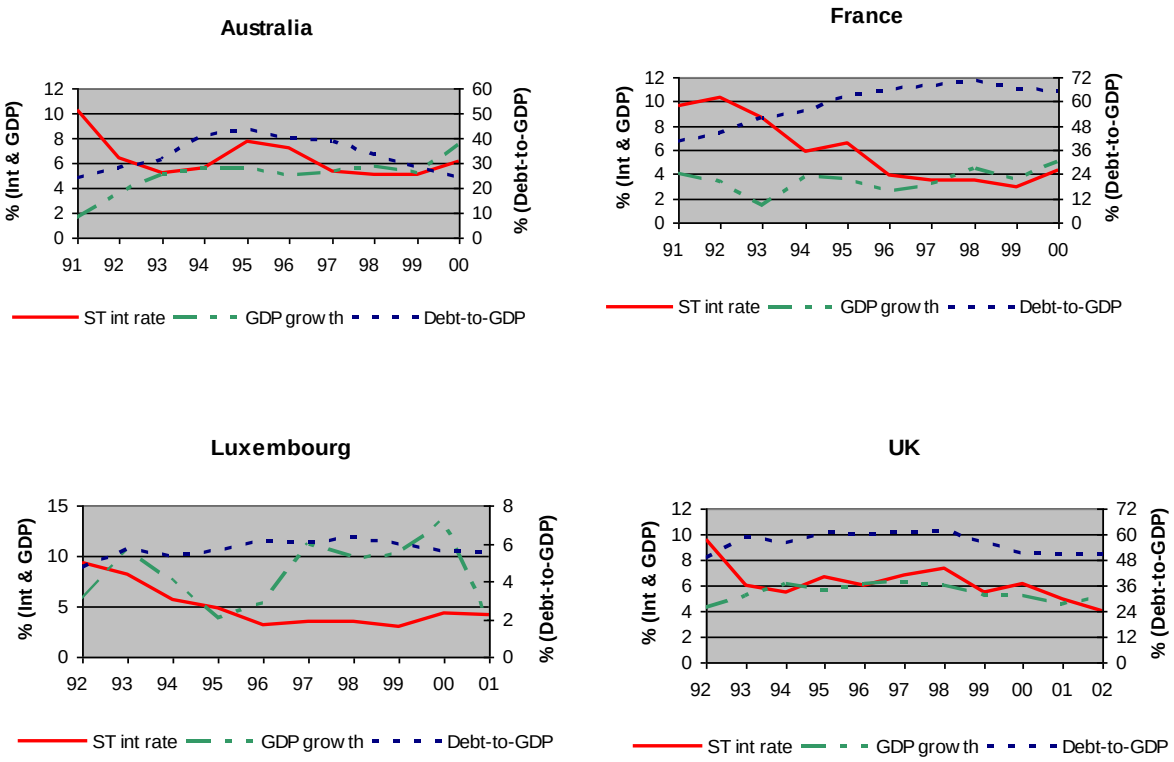
Source: OECD Economic Outlook No. 74

Using the 60% debt-to-GDP limits established under the Maastricht Treaty, six of the 10 countries in our sample are classified as high-debt. Although we are primarily concerned with monetary outcomes in these six countries, we shall also attempt to determine whether central bank policy yields conventional outcomes in the remaining four (low-debt) countries. Let us begin with the conventional case.

Figure 3 plots interest rates and GDP growth rates in the four low-debt countries. If monetary policy yields conventional outcomes, a fairly obvious pattern of *opposing movements* in these time series should be observable.

FIGURE 3

Interest Rates and GDP Growth in Low-Debt Countries

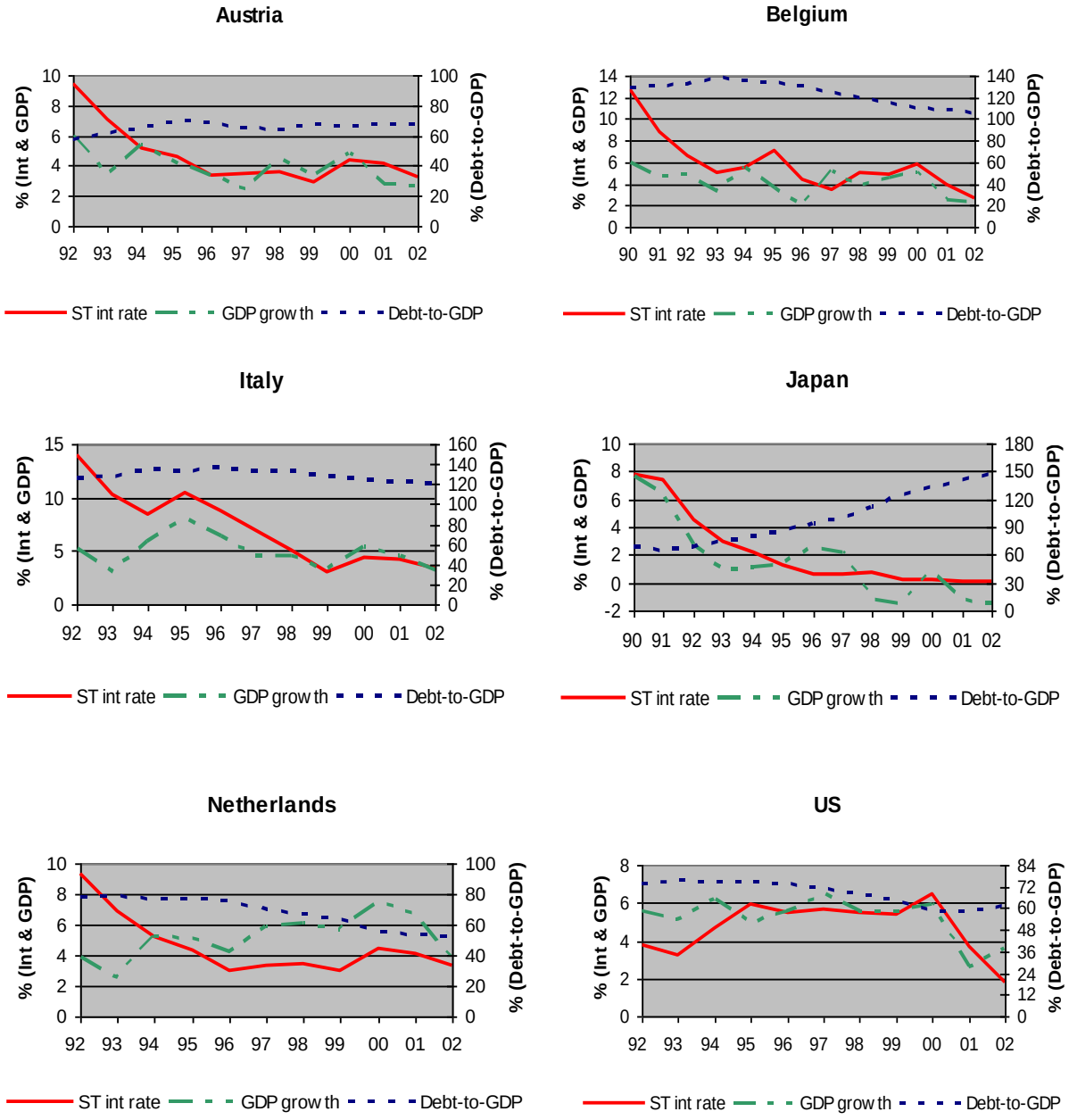


The pattern of interest rate-GDP growth rate movements is striking. In Australia and Luxembourg, where debt-to-GDP levels have never gotten anywhere close to 60% of GDP, interest rates and GDP growth rates clearly move in *opposing* directions. Interestingly, a quite similar opposing pattern is obvious in France (very nearly a mirror image), until about 1995, when debt-to-GDP levels were below 60%. However, after 1995, as debt levels crept above 60%, a high degree of *co-movement* becomes apparent in these series. Finally, in the United Kingdom, monetary policy outcomes appear consistent with conventional theory, at least when debt levels are clearly below 60%.

Time series for the six high-debt countries are shown in Figure 4.

FIGURE 4

Interest Rates and GDP Growth in High-Debt Countries



Once again the patterns are striking. A high degree of *co-movement* is clearly apparent in each of our high-debt countries. Thus, in the high debt countries, any negative interest rate effects – e.g. declining investment or a worsening of the current account – appear to have been more than offset by positive interest rate effects, so that output increased even

as interest rates rose. Focusing on the Italian experience, the potential for perverse macro effects was recognized by Dornbusch (1998), who noted that the private sector's substantial holdings of very short-dated public debt made consumption a positive function of interest rates.[24] As the Dornbusch study indicates, the maturity structure of the public debt can be an important consideration. Table 3 shows the maturity structure of outstanding debt in seven of our OECD countries.

TABLE 2 *Maturity of Government Debt*

Low Debt Countries

France				
	1994	1996	1998	2000
Short-term debt (BTF)	10%	9%	8%	7%
Medium-term debt (BTAN)	27%	26%	27%	25%
Long-term debt (OAT)	63%	65%	65%	68%
Source: Banque de France (http://www.francetresor.gouv.fr/oat/us/t02_01.html)				
Australia				
	1994	1996	1998	2000
Notes (Short term issues)	19%	15%	11%	7%
Bonds	80%	85%	88%	92%
Source: Reserve Bank of Australia (http://www.rba.gov.au/)				
UK				
	1994	1996	1998	2000
Bills	2%	4%	2%	3%
Gilts (including NILO)	98%	96%	98%	97%
Source: Bank of England (http://www.bankofengland.co.uk/Links/setframe.html)				

[24] In this paper, Dornbusch argued that the substitution and (small) wealth effects were outweighed by a relatively large income effect.

High-Debt Countries

Japan				
	1994	1996	1998	2000
Treasury Bills	6%	5%	5%	9%
Medium Term Bonds	5%	8%	7%	14%
Long Term Bonds	89%	87%	88%	77%
Source: http://www.boj.or.jp/en/stat/stat_f.htm				
USA				
	1994	1996	1998	2000
Bills	23%	22%	21%	22%
Notes	60%	61%	58%	52%
Bonds	16%	16%	19%	21%
Source: http://www.federalreserve.gov/releases/				
Italy				
	1995	1996	1998	2000
Bills	21%	18%	12%	9%
Bonds	79%	82%	88%	91%
Source: Bank of Italy (http://www.bancaditalia.it/)				
Belgium				
	1994	1996	1998	2000
Short Term Debt	27%	23%	21%	16%
Long Term Debt	73%	77%	79%	84%
Source: Die Oesterreichische Nationalbank (http://www.oenb.co.at/)				

Thus, we see that as Italy, whose outstanding short-term debt was relatively large, began *cutting* interest rates (in compliance with the Maastricht convergence criteria) in the early 1990s, it resulted in substantial reductions in interest expenditure, which appear to have contributed to a significant *decline* in output.[25] In contrast, in the UK, where short-dated offerings are negligible, monetary policy has had the predicted (i.e. conventional) outcomes, even as debt-GDP ratios hovered around the 60% mark throughout most of the 1990s.

[25] The resulting fiscal tightening kept the lira strong, which reduced aggregate demand, placing a further drag on GDP.

CONCLUSION

Today, most macro economists concede the non-neutrality of money, at least in the short run. Consistent with this position is the notion that central bank tightening will dampen the pace of economic activity while monetary easing should stimulate output and employment. Our paper challenges the theoretical grounds for these conventional outcomes, arguing that outcomes appear to depend – at least in part – upon the size, sectoral distribution and maturity of the government's debt. Our Monetary Policy Outcomes (MPO) curve, which stressed the importance of debt size, summarized this argument graphically. Empirically, we showed that when high-debt countries pursue expansionary monetary policy, the outcome may be contractionary because lowering rates cuts fiscal expenditures, perhaps by a very large number (e.g. Italy a decade ago). Similarly, monetary tightening may have had stimulative effects in countries with high debt-to-GDP ratios. In contrast, we show that monetary policy has the predicted effects in countries with low debt-to-GDP ratios.

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