

Appendix 4

The macroeconomic impact of fiscal policy

Fiscal policy consists of the finances of the national and local governments and reflects the tax collection needed to fund public services and transfers. Because it can also have macroeconomic effects, it can be argued that the public sector should also play a stabilising role; that is, that it should time its actions so as to minimise business cycles and promote low, stable inflation, as is the goal of monetary policy.

This Appendix discusses the macroeconomic effects of two public sector economic policy tools – expenditure changes and tax changes – as determined using the Central Bank's Quarterly Macroeconomic Model (QMM) (see Danielsson et. al. 2006).¹ The effects are found to be very similar to those in other small, open economies.

Different views on the economic effects of fiscal policy

In recent years, great strides have been made in academic research on the conduct of monetary policy and its impact on the economy. Similar research on fiscal policy has been carried out less often, however, and economists still disagree somewhat on how important a role fiscal policy actually plays in stabilising the economy.²

Among classical economists, it was generally thought that fiscal policy really had no stabilisation role, as it was assumed that the factors of production were always fully utilised. Increased public sector activity would simply crowd out private spending so that aggregate demand would remain unchanged (and equal to aggregate supply). The Great Depression and the writings of John Maynard Keynes changed this view. The factors of production could be underutilised for extended periods of time, making increased public expenditure an effective tool for stimulating demand and employment levels. Many even believed that the increased activity would ultimately outpace the original increase in expenditure. The boost in public spending would not only have a direct effect on aggregate demand; it would also work indirectly, in that elevated employment and income levels would stimulate private spending. The so-called “multipliers” of fiscal policy were therefore thought to be greater than unity.

Both experience and recent research indicate, however, that these multipliers are much smaller than previously thought – and likely less than one – especially in small, open economies. The reason is that increased demand causes relative prices to adjust. For example, increased activity means that, other things being equal, interest rates

1. A comparable analysis of the effect of monetary policy can be found in Appendix 1 of *Monetary Bulletin* 2006/3, “The transmission mechanism of monetary policy in the Central Bank's quarterly macroeconomic model,” pp. 57-60.

2. A detailed survey can be found in Hemming et. al. (2002). Dunstan et. al. (2007) also contains an accessible summary. See also the discussion of the role and impact of fiscal policy in the new OECD report on Iceland: *OECD Economic Surveys – Iceland*, February 2008.

rise (for instance, because the public sector needs more borrowed funds and because monetary policy responds to mounting inflationary pressure by raising the policy interest rate). When interest rates rise, increased public expenditure crowds out private spending, thus reducing the multipliers. This crowding-out effect is probably even more profound in small, open economies, where increased expenditure and rising interest rates tend to strengthen the local currency, which crowds out domestic demand and weakens the competitiveness of the domestic export and competitive sectors. Exports decline, while imports increase. A part of the boost to expenditure therefore “leaks” out of the economy, thus reducing the multipliers. The same applies to tax multipliers. Tax cuts increase households’ disposable income and businesses’ after-tax profits, but the impact on aggregate demand is less than the original tax reduction, as the private sector allocates only a portion of the increased income to expenses and may even decide to save more in anticipation of future tax increases. Tax multipliers are therefore somewhat below one as well. Most studies also indicate that they are slightly smaller than expenditure multipliers (see, for example, Hemming et. al., 2002). On the other hand, they could be more persistent than expenditure multipliers because households distribute the increased consumption resulting from tax cuts over a period of years.

The economic impact of fiscal policy will be less, the more forward-looking the private sector is and the more able it is to shift spending decisions from one period of time to another. Some economists have even gone so far as to say that this renders fiscal policy ineffective. Should the public sector increase its current level of expenditure in an attempt to stimulate aggregate demand, the private sector will understand that the increase must ultimately be funded through higher tax levies or a corresponding contraction in expenditure later on. Therefore, they will increase their savings in order to set aside funds to pay for future tax increases, with the result that the contraction in private spending exactly offsets the original increase in public expenditure. This is referred to as the Ricardian equivalence result (see Barro, 1974). Most research suggests that the Ricardian equivalence result may exist but that it is imperfect (see, for example, Masson et. al., 1995). This could be, for example, because individuals have limited possibilities for shifting consumer spending forward due to imperfect credit markets. Nevertheless, the effects of forward-looking expectations can complicate the effects of fiscal policy. For instance, expectations of future tax cuts could stimulate current expenditure because expected permanent income has risen. Similarly, a credible statement announcing a permanent reduction in public expenditure could increase aggregate demand because of expectations of lower future taxes (see, for example, Giavazzi and Pagano, 1990).

3. This discussion ignores the potential long-term effect of lower taxes on the supply side of the economy. If a tax cut promotes increased labour market participation or boosts investment, it will ultimately raise potential output. This discussion only focuses on the effect of fiscal policy on demand, which is most relevant for the conduction of monetary policy at any given time.

The effect of increased public expenditure

To assess the impact of fiscal policy on the domestic economy, the macroeconomic model of the Central Bank (QMM) is applied. The effect of public expenditure is examined by carrying out the following simulation. In a given quarter, public consumption increases by 1% of GDP, and that level of expenditure is maintained for five years. The increased expenditure corresponds to a roughly 8 b.kr. increase in annual public consumption in terms of year-2000 prices (just over 13 b.kr. in 2007 prices), which roughly equals a 4% real increase in public consumption. GDP rises immediately by 0.4 percentage points, and the effect peaks a year later, when the expenditure multiplier is around 0.6 (see Table 1). The expenditure shock therefore stimulates general demand quite quickly. Unemployment begins to fall, real wages rise, and asset prices increase (and therefore net wealth as well). This causes private consumption and investment to increase over and above the baseline scenario. Offsetting this is a rising real exchange rate, which causes a decline in exports with respect to the baseline scenario. Increased domestic demand and a rising real exchange rate direct a portion of the demand impulse towards imported goods and services, thus boosting imports considerably. Increased demand also fuels inflationary pressure and puts upward pressure on interest rates. After roughly two years, inflation peaks at about 0.2 percentage points above the baseline scenario, with interest rates about 0.5 percentage points above the baseline, assuming that monetary policy responds according to a conventional Taylor rule. As the table illustrates, the impact on GDP fades out gradually and has more or less vanished after slightly more than three years. The effects will disappear much more slowly, however, in the absence of monetary policy response.

Table 1 Effect of fiscal policy on GDP

	<i>Expenditure multipliers (with monetary policy response)</i>		<i>Tax multipliers (with monetary policy response)</i>	
	<i>After 1 year</i>	<i>After 3 years</i>	<i>After 1 year</i>	<i>After 3 years</i>
Iceland	0.60	0.12	0.31	0.50
New Zealand	0.61	0.06	0.19	0.03
United Kingdom	0.80	0.21	0.41	0.86
United States	1.10	0.00	0.30	0.50

	<i>Expenditure multipliers (without monetary policy response)</i>		<i>Tax multipliers (without monetary policy response)</i>	
	<i>After 1 year</i>	<i>After 3 years</i>	<i>After 1 year</i>	<i>After 3 years</i>
Iceland	0.65	0.72	0.33	0.91
Denmark	0.78	0.70	-	-
Euro area	1.06	1.01	-	-
United States	1.40	1.10	0.40	1.00

The calculations show the estimated effect of increased public consumption, on the one hand, and an income tax cut, on the other, in both instances amounting to 1% of GDP, either for five years (Iceland, New Zealand, and the UK) or permanently (US, Denmark, and euro area). The effect for New Zealand is obtained from the Reserve Bank of New Zealand's FPS model (Dunstan et. al., 2007). The effect for the UK is the average result from five models surveyed in Church et. al. (2000). The results for the US are obtained from the US Federal Reserve Bank's FRB/US model (Reifschneider et. al., 1999). The results for Denmark are obtained from the MONA model used by the Danish central bank (Danmarks Nationalbank, 2003). The results for the euro area are the average for 12 euro countries (Fagan and Morgan, 2005).

The effects of tax cuts

The macroeconomic effects of tax cuts are assessed as follows. In a given quarter, individual income taxes are reduced by an amount corresponding to 1% of GDP, and that tax rate is maintained unchanged for five years. On an annualised basis, the tax cut corresponds to just over 8 b.kr. in terms of year-2000 prices (slightly over 13 b.kr. in 2007 prices), or a 1.2 percentage point reduction in the income tax rate. Because the tax cut affects GDP only indirectly through private sector spending decisions and is not a direct part of aggregate demand, as public consumption is, this effect will take a longer time to emerge. Therefore, GDP rises immediately by just over 0.1 percentage points and peaks after approximately two years, at roughly 0.5 percentage points above the baseline scenario. The effect of the tax reduction on inflation, real exchange rate, and interest rates is comparable to that in the public expenditure example, offsetting the output stimulation. The peak effect on inflation emerges after just over three years, when inflation is about 0.2 percentage points higher than in the baseline example and interest rates some 0.5 percentage points higher. In the absence of monetary policy response, the tax multiplier continues to increase, peaking at around unity after approximately four years.

Comparison with other countries

Table 1 also gives a comparison of the results for several other countries. As the table shows, the expenditure multipliers in Iceland are similar to those in other small, open economies such as New Zealand and Denmark. They are smaller, however, than those in larger economies such as the US, the UK, and the euro area. This is probably caused by the additional crowding-out effect through the real exchange rate and the "leakage effect" of growing imports on small, open economies (see also Dunstan et. al., 2007). These results are consistent with the findings of Fagan and Morgan (2005) with respect to the euro area. They find that the short-run expenditure multipliers are usually greater than unity for larger countries – such as France, Italy, Spain, and Germany – and somewhat less for smaller countries like Luxembourg and Greece. These results are also in line with the findings of Hemmings et. al. (2002), who find that the short-run expenditure multipliers are usually between 0.6 and 1.4. Tax multipliers in Iceland, however, are similar to those in the US and the UK (for one year) and somewhat larger than those in New Zealand. They are also in line with the conclusions drawn by Hemmings et. al. (2002), who report that short-term tax multipliers generally lie between 0.3 and 0.8.⁴

4. There are fewer comparative studies of the effect on inflation; however, the effect seems to be similar for Iceland, the US, and the euro area. In the absence of monetary policy response, inflation in Iceland is 0.28 percentage points higher than it would have been two years after the expenditure increase, while it is 0.22 percentage points higher in the euro area (the average of 12 euro countries; see Fagan and Morgan, 2005) and 0.50 percentage points higher in the US (Reifschneider et. al., 1999). Corresponding to this is the effect of a tax cut on inflation after two years: 0.14 percentage points for Iceland and 0.10 percentage points for the US. The response of interest rates, if they are allowed to respond, is also similar in these three instances.

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