SPECIAL ANALYSIS

Short-run effects of fiscal policy on GDP and employment in Sweden

The Swedish economy is currently booming, but sooner or later it will return to operating below capacity. This makes it important for there to be scope for active fiscal policy, and for decision-makers to have an understanding of how different fiscal instruments affect the economy. This special analysis summarises the results of a study commissioned by the government in which the NIER assesses how different fiscal instruments impact on GDP and employment in the short run.[1] Government investment seems to have the highest fiscal multiplier, but the results of the study need to be interpreted with care as they are not significant at a 95 per cent confidence level.

RENEWED INTEREST IN FISCAL POLICY'S MACROECONOMIC EFFECTS

The eruption of the financial crisis and subsequent prolonged slump in Europe and the US have sparked a renaissance in studies of the stabilisation function of fiscal policy.[2] This is partly because monetary policy has proved unable to restore many economies to their full potential despite record-low and even negative central bank benchmark rates. This has turned the spotlight onto the extent to which fiscal policy can be used for economic stabilisation. Budget deficits rocketed in many countries at the beginning of the slump. Some therefore introduced austerity measures in the midst of the slump, and both in academia and at policy institutes there has been keen interest in the effects of this consolidation on GDP and employment.

In an economy such as Sweden with a flexible exchange rate and an inflation target, monetary policy has prime responsibility for economic stabilisation. Interest rates are expected to remain low for many years to come, which means that the scope for monetary policy to deal with an economic slump may prove limited. Fiscal policy may therefore need to play a bigger role than normal in the next slump. Fiscal measures also generally take longer to decide and implement than monetary policy decisions. It is therefore important to be well-prepared when action does need to be taken. One element in these preparations is to gauge the effects that different fiscal instruments have on the

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[1] This analysis summarises the results from Hjelm and Stockhammar (2016).

[2] A recent overview can be found in Ramey (2016).

Diagram 134 Cumulative GDP multiplier for consumption

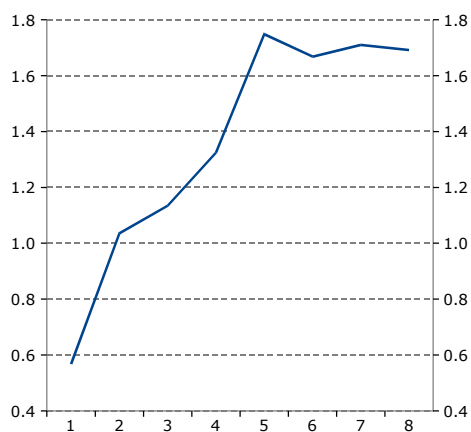Cumulative change in GDP in relation to cumulative change in consumption
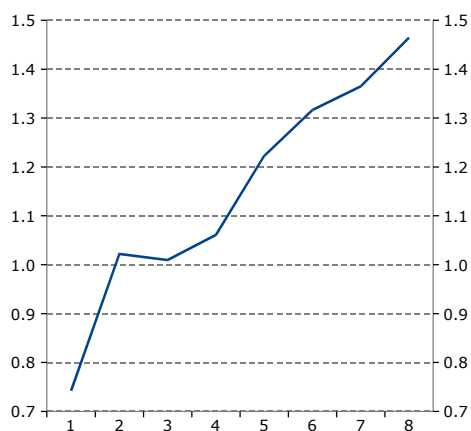
Note. The diagram refers to the quarterly cumulative change for the Baseline specification in Table 1.
Source: Hjelm and Stockhammar (2016).

Diagram 135 Cumulative GDP multiplier for investment

Cumulative change in GDP in relation to cumulative change in investment

Note. The diagram refers to the quarterly cumulative change for the Baseline specification in Table 1.
Source: Hjelm and Stockhammar (2016).

economy in both the short and the long run. This analysis focuses on the short-run stabilisation effects of fiscal policy.

GOVERNMENT INVESTMENT IMPACTS MOST ON GDP

The NIER's study analyses five different fiscal variables:
- Government consumption
- Government investment
- Transfers to households
- Indirect taxes on consumption goods
- Direct taxes on households

Statistics Sweden has recently published quarterly data from 1980 onwards for a relatively wide range of fiscal variables, making it possible to explore how fiscal policy has impacted on macroeconomic developments in Sweden.[3] The study draws three general conclusions about the effects on GDP. It is important to bear in mind, however, that the point estimates are not, as a rule, significant at a 95 per cent confidence level, which means that the results are associated with considerable uncertainty.

First, fiscal instruments generally have Keynesian effects in Sweden. This means that higher government spending or lower taxes will push up GDP in the short run (see the row "Baseline" under the heading "Hjelm and Stockhammar" in Table 1, and Diagrams 134−137). The effect is greatest for government investment, followed by government consumption. Over the full period, the average cumulative multiplier for different econometric specifications, for a weighted average of the five fiscal variables listed above, is around 1 on both a one- and a two-year horizon (see Table 2).[4]

Second, there do not appear to be any general patterns in how the state of the business cycle influences the effect of fiscal instruments on GDP. The results are, however, sensitive to how a slump is defined. If we take an average of the results for different definitions of a slump, the effect on GDP is more or less the same in a slump as in calculations where slumps are not separated out (see the rows "Slump" and "Baseline" under the heading "Hjelm and Stockhammar" in Table 1). The baseline

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[3] Here we study the effect of fiscal "shocks". These shocks are identified using structural VAR models in line with Blanchard and Perotti (2002). See section 2.1 of Hjelm and Stockhammar (2016) for a more detailed description of the methodology.

[4] The cumulative multiplier measures how much GDP increases in SEK over a period of, say, two years in relation to the fiscal variable, where the increase in the latter comprises the sum, in SEK, of increased expenditure and reduced taxation. For example, a cumulative multiplier of 1 means that an increase in government consumption of SEK 1 billion over a period of, say, two years will result in GDP increasing by the same amount during that period. See section 4.1 in Hjelm and Stockhammar (2016) for a more detailed definition of the cumulative multiplier.

comprises the linear effects where different states of the business cycle are not treated differently. Thus fiscal policy is equally potent whether applied in a boom or a bust.

Third, the estimated effects on GDP are generally slightly greater than an average of the estimates made in the international empirical literature.[5] Two comparisons are made with previous studies. In the first, the results are compared with a meta-study which uses econometric methods to weight together the results of 98 studies and a total of 1,882 empirical estimates of the GDP effects of fiscal policy.[6] The comparison is presented in Table 1 below in the rows labelled "Baseline". As can be seen from the table, the effects on GDP are generally greater in the NIER's study, especially in the case of government consumption and transfers.

Table 1 Cumulative GDP multipliers after eight quarters for the period 1993q1 to 2015q3

Cumulative change in GDP in relation to cumulative change in fiscal instruments

|	Government consumption	Government investment	Transfers	Taxes
Gechert and Rannenberg (2014)				
Baseline	0.4	1.4	0.3	0.3
Slump	0.9	1	1.7	-0.5
Hjelm and Stockhammar (2016)				
Baseline	1.5	1.7	1.3	0.8
Slump	1.6	1.9	0.8	1.1

Note. This is a condensed version of Table 1 in Hjelm and Stockhammar (2016). The effects of indirect and direct taxes are weighted together in the "Taxes" column because Gechert and Rannenberg (2014) do not report them separately.

Source: Gechert and Rannenberg (2014), Hjelm and Stockhammar (2016).

The second comparison is based on a method developed by the IMF.[7] As in the meta-study above, the results from the empirical literature are combined. In this case, however, countries are grouped into buckets (high, medium and low) according to the strength of fiscal policy's GDP effects. This is done on the basis of factors that have been shown in empirical studies to influence how GDP reacts to fiscal policy, such as exchange rate regime,

Cumulative change in GDP in relation to cumulative change in transfers
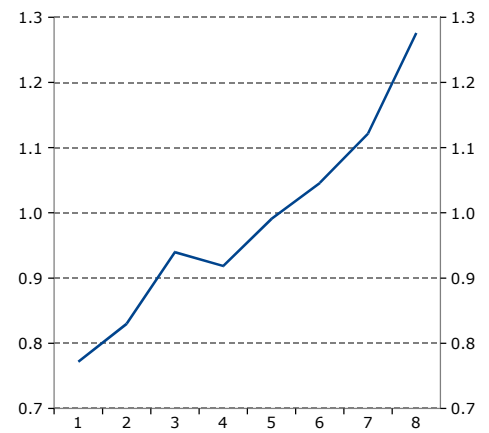
Note. The diagram refers to the quarterly cumulative change for the Baseline specification in Table 1.
Source: Hjelm and Stockhammar (2016).

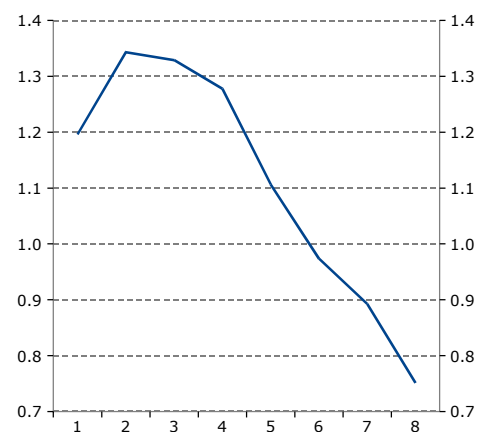Cumulative change in GDP in relation to cumulative change in taxes

Note. The diagram refers to the quarterly cumulative change for the Baseline specification in Table 1.
Source: Hjelm and Stockhammar (2016).

trade openness, size of public sector and level of public debt. Sweden comes in at the lower end of the middle category, in other words the category where the GDP effects of fiscal policy are moderate.[8] Thus this method indicates that the effects of fiscal policy in Sweden should be relatively small.

The GDP effect in the IMF analysis is an average change in fiscal policy comprising equal changes in spending and revenue. Table 2 compares this bucket approach with the results of the NIER's study.[9] As in the comparison in Table 1, based on a different meta-study, the estimated multipliers for Sweden are higher than the average in previous studies.

Table 2 GDP multipliers for Sweden: IMF bucket approach compared with NIER study

Cumulative change in GDP in relation to cumulative change in fiscal policy

	Year 1	Year 2
IMF bucket approach in Batini et al. (2014)	0.4−0.6	0.48−0.72
Hjelm and Stockhammar (2016), average	1.1	1

Note. This is a condensed version of Table 3 in Hjelm and Stockhammar (2016). The second row is based on an average of the GDP effects of the five fiscal instruments and specifications with and without an output gap for the OECD countries.

Source: Batini et al. (2014), Hjelm and Stockhammar (2016).

GOVERNMENT INVESTMENT ALSO IMPACTS MOST ON EMPLOYMENT

The employment effects of fiscal policy are estimated using the same methods as for GDP above. There are several qualitative similarities with the results for GDP. As with GDP, the employment effects are, in principle, exclusively Keynesian – in other words employment rises (falls) with expansionary (contractionary) fiscal policy. Table 3 presents the percentage effect on employment of fiscal expansion equivalent to 1 per cent of GDP. As with GDP, investment has the greatest impact on employment.

The employment effects of government spending – consumption, investment and transfers – are greater in a slump. As can be seen from Table 3, this applies particularly to consumption. When no account is taken of the state of the business cycle

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[8] Thus there is no estimation of the effects of fiscal policy specifically on Swedish data.

[9] It should be noted, however, that in Table 2, unlike in Table 1, there is no specification of how the multipliers are calculated in Batini et al. (2014). They are probably a combination of peak, impact and cumulative multipliers (see section 4.1 in Hjelm and Stockhammar (2016) for definitions). The NIER's study estimates only cumulative multipliers.

("Baseline"), the employment effect of government consumption is neutral (despite the GDP effect being positive, see Table 1). In a slump, however, employment will rise by an average of 0.4 per cent when government consumption increases by 1 per cent of GDP, at both a one- and a two-year horizon. It can also be seen that government investment has the greatest impact on employment, both in the baseline case and in a slump. This was also the case with GDP (see Table 1).

There are far fewer studies analysing employment effects than GDP effects. Most also use more aggregated fiscal variables, such as total government expenditure, whereas the NIER analyses five disaggregated fiscal variables. In the studies available, all from outside Sweden, the effects on employment vary from 0 to 0.5 per cent, which is within the range reported in Table 3 below.[10]

Table 3 Effects on employment

Percentage change in employment with fiscal expansion equivalent to 1 per cent of GDP

	Con-sumption	Invest-ment	Trans-fers	Indirect taxes	Direct taxes
Baseline					
Year 1	0.0	0.4	0.2	0.2	0.1
Year 2	0.0	0.3	0.2	0.1	0.0
Slump					
Year 1	0.4	0.6	0.4	0.1	0.2
Year 2	0.4	0.4	0.3	0.1	0.1

Note. This is a condensed version of Tables 5 and 6 in Hjelm and Stockhammar (2016). The first row under "Baseline" is an average of the first and third rows (i.e. "4 quarters") in the columns marked "(2)" in Table 5 in Hjelm and Stockhammar (2016). The second row under "Baseline" is an average of the second and fourth rows (i.e. "8 quarters") in the columns marked "(2)" in Table 5 in Hjelm and Stockhammar (2016). The first row under "Slump" is an average of the first and third rows (i.e. "4 quarters") in the columns marked (b) in Table 6 in Hjelm and Stockhammar (2016). The second row under "Slump" is an average of the second and fourth rows (i.e. "8 quarters") in the columns marked (b) in Table 6 in Hjelm and Stockhammar (2016).

Source: Hjelm and Stockhammar (2016).

THE EFFECT OF DIFFERENT INSTRUMENTS CAN VARY

As can be seen from the tables, the estimates presented in Hjelm and Stockhammar (2016) are higher than in most other studies when it comes to the effect on GDP. The results need to be interpreted with care, however, because different model

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[10] See section 5.5 in Hjelm and Stockhammar (2016) for a comparison with other studies looking at employment.

specifications result in effects of different magnitudes, and the effects are not statistically significant.[11]

Nor is it possible to conclude that a fiscal multiplier is the same for all types of instrument that affect a variable. An increase in government consumption in a labour-intensive area, such as elderly care, ought to have different short-run effects on employment to an increase in government consumption due to purchases of goods with a high import content. Institutional factors such as exchange rate regime, the central bank's room for manoeuvre, fiscal frameworks and confidence in central government finances ought also to affect the size of the multipliers. A change in these variables could therefore result in different fiscal multipliers. The structural effects of fiscal instruments, such as those on potential hours worked and productivity, depend on the specific design of the instruments. Structural effects may have some impact in the short run analysed here, but generally have most of their impact in the longer run.

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Blanchard, O. and R. Perotti (2002), "An Empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output", *Quarterly Journal of Economics 117*, 1329−1368.

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[11] Hjelm and Stockhammar (2016) present 95 per cent confidence intervals. There are also sensitivity analyses for different model specifications.