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Fiscal Policy Spillovers

Abstract:
This paper uses the National Institute Global Econometric Model (NiGEM) to quantify the magnitude of fiscal spillover multipliers in each Euro Area country following a fiscal shock to one particular Euro Area country. Spillover multipliers lie between 0.01 and 0.3 per cent when the fiscal shock takes place in Germany. These estimates correlate with the degree of trade linkages between Euro Area countries and on the elasticity of imports to total final expenditure of each country. Our analysis suggests that fiscal spillovers arising from government spending measures are larger than those arising from changes in taxation. Our fiscal spillover estimates increase by 20 to 50 per cent when the proportion of liquidity constrained agents increases by 25 per cent, our proxy for a "crisis time" scenario. We find that fiscal multipliers increase and fiscal spillovers decrease when we decompose total final expenditure in our import equations to allow for varying import intensities across its components.
Keywords: Fiscal policy, Fiscal multipliers, Fiscal spillovers, Macro-econometric model.

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1 Introduction

One of the defining features of the modern economic world is the high degree of economic interrelation among countries via flows of trade, people and capital. Fiscal policies implemented by a country have an impact on other, not necessarily neighbouring, countries, as they affect cross-border resource flows. These spillovers are likely to be stronger within areas with special economic agreements, such as the Euro Area (EA).

This paper quantifies the economic spillover effects induced by contractionary fiscal policies. We implement, one at a time, a broad range of fiscal shocks in each Euro Area country[2], with a particular focus on Germany, and look at the response of output in the remaining Euro Area countries: the fiscal spillover multiplier. Each shock is temporary and lasts for one year. Our emphasis on Germany is motivated by its economic prominence within the Euro Area[3]. We consider a number of fiscal instruments including government consumption and income taxes. Each fiscal instrument generates a different fiscal spillover multiplier as it transmits throughout a country and affects its trading partners in a different way, as well as inducing a different monetary response from the European Central Bank (ECB). Our estimates of the fiscal multipliers for each of the countries that we include in our analysis, reported in Table 1, provide a useful benchmark to compare the magnitudes of the fiscal spillover multipliers that we report in the remainder of the paper. We define a fiscal multiplier as the percentage change in GDP (compared to our baseline forecast) in a country in response to a 1 per cent of GDP fiscal contraction in that country in the same year. A fiscal spillover multiplier is defined as the percentage change in GDP in country X in response to a 1 per cent of GDP fiscal contraction in country Y in the same year. Unless otherwise stated, fiscal spillover multipliers to the Euro Area include the effect on the country experiencing a fiscal contraction.

Table 1: First year multipliers from a 1 per cent of GDP temporary fiscal contraction

	Government Spending		Taxes	
	Consumption	Investment	Income	VAT
Belgium	-0.45	-0.46	-0.10	-0.06
Finland	-0.62	-0.64	-0.20	-0.10
France	-0.58	-0.59	-0.40	-0.15
Germany	-0.46	-0.48	-0.31	-0.28
Greece	-0.94	-0.96	-0.59	-0.12
Ireland	-0.22	-0.22	-0.06	-0.08
Italy	-0.55	-0.56	-0.11	-0.06
Netherlands	-0.55	-0.56	-0.18	-0.11
Austria	-0.49	-0.50	-0.13	-0.05
Portugal	-0.61	-0.62	-0.11	-0.12
Spain	-0.81	-0.82	-0.22	-0.19

Note: No shift in the budget deficit target. Experiments conducted in one country at a time.

[2] Excluding Cyprus, Luxembourg and Malta as they are not included in the model that we use to perform the analysis, NiGEM. Estonia, Latvia, Lithuania, Slovakia and Slovenia are part of NiGEM but we do not include them in the present analysis as they do not have an explicit model for the government sector.

[3] Germany accounts for 28 per cent of Euro Area 2015 GDP (PPP) and constitutes around 24 per cent of the Euro Area population.

We use NiGEM, the National Institute Global Econometric Model, to perform the analysis. NiGEM is an estimated global model with forward-looking agents and built-in nominal rigidities slowing the adjustment process to the equilibrium. Countries in the model are linked through trade, competitiveness and financial markets. Modelling the composition of wealth emphasises the role and origin of foreign assets and liabilities. Monetary and fiscal rules ensure the long-run stability and solvency of the countries included in the model. NiGEM is a theoretically coherent and closed model, in the sense that every export is matched by an import, all liabilities are matched by assets, all income flows from assets are matched by outflows on liabilities and current accounts add up across the world. As far as possible, all country models have the same structure. Differences in the economic behaviour of each country model come from country idiosyncrasies reflected in the data and captured through the estimation process.

Using our estimates of the fiscal spillover multipliers we can investigate which variables determine the magnitude of the spillovers. We consider several possible controls and find that two variables: a measure of trade linkages between countries and the elasticity of imports to total final expenditure (TFE henceforth), go a long way in explaining the observed variation in spillover multipliers. Making use of NiGEM's capabilities we are also able to decompose the magnitude of the spillovers into contributions driven by movements in interest rates and trade flows. We find that movements in interest rates are of second order importance compared to the effect on the spillover multipliers of variations in trade flows.

Our analysis distinguishes between fiscal multipliers in "normal times" and "crisis times". There are several reasons why fiscal multipliers might be dependent on the phase of the business cycle and we review some of them in the following section. In this paper we focus on the role of liquidity constraints. Barrell et al. (2006) suggest that financial crises are usually accompanied by an increase in the share of agents facing liquidity constraints. Liquidity constrained individuals cannot borrow against their future income. As a consequence, their spending plans are more sensitive to short term fluctuations in their current income. Following Al-Eyd and Barrell (2005), we model "crisis times" as a period with a higher sensitivity of aggregate consumption and investment to short term fluctuations in income to account for a larger proportion of liquidity constrained individuals and firms. We find that the magnitude of the fiscal spillover multipliers increases as changes in the purchasing power induced by the fiscal shock have a stronger impact on the investment and consumption decisions of agents.

Import volumes in NiGEM are modelled as a function of real import prices and TFE. As a result, all components of TFE share the same import elasticity. However, it is likely that import intensities vary across components of TFE as certain categories of spending, such as gross fixed capital formation, translate into higher volumes of imported goods than other components, such as public consumption. As a consequence, we should expect the magnitude of fiscal spillover multipliers to be function of the components of TFE. To account for this channel and control for the sensitivity of our previous results, we modify our import equations to decompose TFE into government and private consumption, gross fixed capital formation, exports and a fifth category that includes stockbuilding and the residual in the national account identity. We follow the methodology of Bussière et al. (2013) and use data from the Input-Output tables (2005 data vintage) from OECD to compute the import intensity of each component of TFE. We find that fiscal spillover multipliers decrease in

magnitude as the import intensities of public and private consumption, the main components of TFE affected by fiscal shocks, are smaller relative to the import intensities of investment and exports.

Potentially interesting areas for future research include spillovers from international coordination of fiscal policy, the role of monetary policy in determining the size of fiscal multipliers and fiscal spillover multipliers and a comparison of fiscal multipliers from temporary and permanent shocks. Following a strand of literature in line with Corsetti et al. (2010), it would also be of interest to explore the role that expectations regarding future fiscal consolidation paths play in shaping fiscal multipliers. We aim to address these avenues in a forthcoming paper written under the FIRSTRUN research grant deliverable 2.4. This paper will explore in detail the fiscal multiplier within a number of European economies, and as such provides a useful complement to this paper. Thus, we do not investigate the determinants of fiscal multipliers beyond their impact on fiscal spillovers in this paper.

The structure of the paper is as follows. Section 2 provides a brief summary of the literature on fiscal multipliers. Section 3 details all the assumptions that underlie each of the scenarios that we run. Section 4 presents the fiscal spillover multipliers that arise from each fiscal shock in "normal times". Section 5 compares the previous results with the ones obtained under the parameters that capture "crisis times". Section 6 looks at how the results change when we modify our import equations and Section 7 concludes.

2 Literature review on fiscal multipliers

The measurement and understanding of fiscal multipliers has received a vast amount of attention in the literature, which does not come as a surprise given the interest of policy makers in this topic. Ramey (2011) provides a comprehensive survey of what theory and empirics have found on this topic so far. A common feature of models that look into the size of fiscal multipliers (Neoclassical and New Keynesian) is the effect of government spending on the number of hours worked as capital is fixed in the short run. Neoclassical models rely on wealth effects, inter-temporal substitution of consumption and distortions of first-order conditions. The general finding is that multipliers are below 1 unless we look at the cumulative effect over the long run. New Keynesian models are subject to the same mechanisms but can estimate the multipliers that arise when interest rates hit the zero lower bound. In this case multipliers well exceed 1. After surveying a large body of empirical literature, Ramey (2011) concludes that fiscal multipliers of deficit-financed increases in government spending most likely lie between 0.8 and 1.5.

A number of studies find that the size of multipliers is dependent on the state of the economy. Barrell et al. (2009), DeLong and Summers (2012) and Holland and Portes (2012) all conclude that fiscal multipliers are larger during a downturn than in normal times. This is due to a higher proportion of consumers who face borrowing constraints; interest rates being at or close to the zero lower bound, limiting the ability of monetary policy to react; and an absence of supply constraints. Auerbach and Gorodnichenko (2012) use a regime switching model to capture differences in government spending multipliers given the state of the economy and find that multipliers are between 0 and 0.5 in expansions and between 1 and 1.5 in recessions. Using forecast data from the

Spring 2010 IMF World Economic Outlook, Blanchard and Leigh (2013) found a negative relation between fiscal consolidation forecasts and subsequent growth forecast errors, i.e. forecasters were tending to underestimate fiscal multipliers. They concluded that actual multipliers were substantially larger than 1 during the early years of the crisis. Bagaria et al. (2012) use NiGEM to analyse the effects of the UK's fiscal consolidation programme from 2011 to 2017 and compare to the counterfactual of delaying implementation of the programme until 2014. They estimate that growth is reduced and unemployment increased in both cases but by much less and for a shorter period if delayed until more normal times. According to the authors, the impact is partly driven by heightened fiscal multipliers and exacerbated by hysteresis effects.

Other factors which can affect the size of multipliers include country size, degree of openness and the duration of the shock. Barrell et al. (2012) find that multipliers are smaller in more open economies since more of the fiscal shock is "leaked" through imports. The authors find that multipliers coming from permanent shocks are smaller than multipliers coming from temporary shocks, since the effect on long rates is larger, and the difference in magnitude between permanent and temporary shocks is larger in large economies. Countries in the Euro Area and those without independent monetary policy exhibit smaller initial interest rate responses to fiscal shocks and so have larger multipliers. Ilzetzki et al. (2013), using a novel quarterly dataset including a large number of developed and emerging market economies, also find that the degree of openness is negatively related to fiscal multipliers. They find that countries with higher levels of debt experience smaller – or even negative - multipliers. One proposed explanation for this result is that fiscal expansions in highly indebted countries act as a signal of future austerity measures, and the expectation of such contractionary policies dominates the short term effect of the initial fiscal expansion.

The existence of spillover effects, whereby reduced growth in one country reduces growth in other countries via trade linkages, means that multipliers will be larger when fiscal consolidation is coordinated across countries. Holland and Portes (2012) simulate the actual fiscal programmes announced by 12 European Union countries for 2011-2013. They find that when policies are enacted jointly rather than unilaterally, the effect on the level of GDP in 2013 is on average 2 percentage points lower. Barrell et al. (2009) also look at the effect of spillovers and find that fiscal coordination increases the magnitudes of the multipliers and remark that the effects will be larger the more open the country is, as they benefit from increased imports of neighbouring countries, and the less sensitive to developments of financial markets, as coordinated fiscal policy has larger effects on the long run interest rates.

In a world with perfect foresight, frictionless capital markets and flexible prices, the only thing that matters in terms of fiscal multipliers is the change in the present discounted value of disposable income of the agents in the economy. Any deviation from these conditions will translate into multipliers being a function of the instrument used. Barrell et al. (2012) find that spending multipliers are larger than tax or benefit multipliers, as in the latter case part of the change in disposable income is siphoned off through adjustments in savings. Barrell et al. (2009) find that in the expansionary phase of the business cycle, VAT reductions are more effective than direct tax rebates as the change in prices driven by the change in the indirect tax rate brings consumption forward, while in the case of direct tax rebates part of it is saved. The result is reversed when the economy is in recession as the direct tax rebates ameliorate the problems faced by a growing number of agents who are liquidity constrained.

Fiscal multipliers depend not only on the policy implemented at the time of the announcement but also on the plans announced for the future. This has been illustrated by Corsetti et al. (2010) who show that increases in government spending followed by announced medium term consolidation plans produce higher fiscal multipliers and spillovers. The mechanism works via the long term interest rate. Short-term rates increase following a surge in government spending, but if people expect future consolidations to take place this implies lower future short term rates, which means that the current long term rate not only increases by less but it could even fall. This channel is slightly at odds with the findings mentioned above by Ilzetzki et al. (2013), but it is not clear that the results of Ilzetzki et al. (2013) constitute a proper test of the mechanism outlined by Corsetti et al. (2010).

Another strand of the literature looks at which elements contribute to a successful consolidation period, understanding successful as achieving a long-lasting reduction of the government deficit – according to a certain metric. This exercise has been done by, amongst others, Alesina and Perotti (1995) and Larch and Turrini (2011). The general consensus is that successful consolidations happen during periods where deficits are large, and when they are implemented through reductions in government spending on transfer programs and public sector wages rather than cuts in government investment or tax hikes.

Other papers in the literature, such as Gros and Hobza (2001) and in't Veld (2013) have used large multi-country macro models to quantify the magnitude of multipliers and disentangle channels through which the shocks transmit throughout the economies. Our analysis is similar in spirit to those papers and constitutes an update of the results using one such large macro model, NiGEM.

3 The modelling framework

3.1 The National Institute Global Econometric Model (NiGEM)

NiGEM is a large estimated quarterly model of the UK and the world economies. The model is intended to capture the key features of the major world economies. It is theoretically coherent and quantified by means of empirical estimation over recent historical experience. It provides a plausible benchmark for estimating the effects on the economy of different policy decisions as well as other types of shocks. In contrast to many small theoretical models of the economy, its complete specification ensures that important features of the economy are not omitted from the analysis.

In the model framework agents can be forward looking, but nominal rigidities, namely sticky prices and adjustment costs, slow down the adjustment to the long-run equilibrium. It includes complete demand and supply sides, as well as extensive monetary and financial sectors. Domestic demand, aggregate supply, and the external sector are linked through the wage-price system, income and wealth, the financial sector, the government sector, and competitiveness. The external sector links the domestic economy to the rest of the world. The theoretical structure and the relevant simulation properties of NiGEM are described in detail in Barrell et al. (2001, 2004).

For each country we have an underlying CES production function which constitutes the theoretical background for the specification of the factor demand equations and provides a measure of capacity utilisation which then feeds into the price system. A CES production function that embodies labour augmenting technological progress (denoted λ) with constant returns to scale, can be written as:

$$Q = \gamma\left\{\left[s(K)^{-\rho} + (1-s)(Le^{\lambda t})^{-\rho}\right]^{-1/\rho}\right\}^{\alpha} M^{1-\alpha} \quad (1)$$

where is Q is real output, K is the total capital stock, L is total hours worked, t is an index of labour-augmenting technical progress and M is oil input. This constitutes the theoretical background for the specifications of the factor demand equations, forms the basis for unit total costs and provides a measure of capacity utilization, which then feeds into the price system.

Barrell and Pain (1997) show that the elasticity of substitution is estimated from the labour demand equation, and in general it is around 0.5. Demand for labour and capital are determined by profit maximisation of firms, implying that the long-run labour-output ratio depends on real wage costs and technical progress, while the long-run capital-output ratio depends on the real user cost of capital:

$$\ln(L) = \alpha + \ln(Y) - (1-\sigma)\lambda t - \sigma \ln(w/p) \quad (2)$$

$$\ln(K) = \delta + \ln(Y) - \sigma \ln(c/p) \quad (3)$$

where α and δ are constant terms related to the other parameters in the model, *w/p* is the real wage and *c/p* is the real user cost of capital. The user cost of capital is influenced by corporate taxes, depreciation (consumption of fixed capital) and risk premia and is a weighted average of the cost of equity and debt finance. The weights vary with the size of equity markets as compared to the private sector capital stock. Business investment is determined by the error-correction based relationship between actual and equilibrium capital stocks. It is the response of firms that is one of the main drivers of any boost to aggregate demand. Firms anticipate the expansion of the labour force and aggregate incomes and hence invest to raise the level of capital stock to a new equilibrium in order to maintain their desired capital-output ratio. This shift raises demand through an increase in investment: the accelerator effect. This is not an immediate response but rather a gradual shift to a new equilibrium, due to such factors such as adjustment costs for implementing additional investment. Government investment depends upon trend output in the long run. Prices are determined as a constant mark-up over marginal costs in the long term.

Within NiGEM, core prices are determined as the solution to a cost minimization problem, which assumes that firms choose factor inputs to minimize the cost of producing the desired level of output. Core prices are driven by import prices and by the total cost of production, where the latter is constructed from the wage per person hour and the nominal user cost of capital per unit of capital. We incorporate an endogenous markup, which we model as a function of the output gap. This core price variable is used in the determination of consumer prices and hence of the rate of inflation. The price equations, and the wage equations that they depend upon, are dynamically and statically homogenous.

Capacity utilisation also affects price setting and depends on actual as opposed to potential output. If output is above capacity, prices rise more rapidly than their determinants (foreign prices, costs, expectations) would suggest, and the reverse is the case if the economy is below capacity. If prices fall relative to baseline because the economy is below capacity then real financial wealth rises, and competitiveness improves, and both help raise capacity utilisation through higher domestic demand and exports. These effects stabilise the economy slowly.

3.1.1 Labour market

In NiGEM we have a labour demand curve, and we assume that employers have a right to manage, and hence the bargain in the labour market is over the real wage. In the long run wages rise in line with productivity all else equal. Other factors matter too; for instance if unions become stronger real wages rise and employment falls. Given the determinants of the trajectory for real wages, if unemployment rises then real wages fall relative to trend, and conversely.

There is continual structural change in labour markets and sustainable unemployment changes when policies change. We regularly update our model so that it reflects the economies we are studying, rather than being just a simple description of past data. Both the determinants of equilibrium and the dynamics of adjustment change, and adjustment, especially in Europe, is slow.

We assume that labour markets embody rational expectations, at least where we have evidence that bargainers use forward expectations of future inflation (Anderton and Barrell, 1995). In certain circumstances we assume that wage bargainers do not use model consistent expectations, but rather look at a simple time series predictor for next period's inflation.

A long-run labour demand schedule conditioned on real wages, technical progress and output (Barrell and Pain, 1997) can be derived from the production function (1). We first set the mark-up adjusted real wage equal to the marginal product of labour[4], which is the derivative of (1) with respect to L. We then solve for L and apply a log-linear transformation:

$$Ln(L) = \left[\sigma \ln\{\beta(1-s)\} - (1-\sigma)\ln(\gamma)\right] + \ln(Y) - (1-\sigma)\lambda t - \sigma \ln(w/p) \qquad (4)$$

where *w* and *p* denote respectively labour costs per head and the price of value added (at factor cost). β denotes the mark-up. Denoting the expression in brackets by α gives equation (2). We estimate the demands for factors as error corrections around the long run.

We estimate the natural rate of unemployment within a stylised version of the bargaining framework of Layard et al. (1991, Chap. 2). Firms determine employment according to their labour demand curves and therefore bargaining only takes place over wages, the outcome reflecting the relative strength of unions versus employers. The non-accelerating inflation rate of unemployment is an equilibrium concept corresponding to the rate of unemployment that would prevail were the

[4] Demand for capital is given by $Ln(K) = \left[\sigma \ln(\beta s) - (1-\sigma)\ln(\gamma)\right] + \ln(Y) - \sigma \ln(c/p)$, where c is the nominal user cost of capital. Denoting the bracket of the equation as δ gives equation (3).

endogenous wage and price variables at their equilibrium levels (Barrell et al., 1993). Our analysis uses a labour demand equation (as described above) and a wage equation.

The wage equation models in a stylised way the determinants of the bargaining outcome by making wages dependent on the prevailing ILO unemployment rate (*U*), as well as on average labour productivity. Clearly, many other factors such as replacement ratios, the degree of unionisation or the existence and level of minimum wages influence the bargain. In this analysis they are encapsulated in the intercept, a, and we can analyse them by shifting the intercept. It then holds that:

$$\ln(W/P) = a + \ln(Y/L) - bU \tag{5}$$

An estimate of the NAIRU can now be obtained by solving the labour demand equation (2) for the (log) real wage, inserting the result into the equation for the real wage (5) and solving the latter for the unemployment rate:

$$NAIRU_t = \frac{1}{b}\left(\frac{\sigma-1}{\sigma}\left[+\ln\left(\frac{Y_t}{L_t}\right)-\lambda t\right]-a-\alpha/\sigma\right) \tag{6}$$

If σ=1 then the parameters and intercepts in the equations determine the NAIRU. These equations express long-run equilibrium relationships, and appear as cointegrating vectors in NiGEM's error correction formulation for the labour demand and wage equations, respectively. Layard et al. (1991), state that "in the long-run, unemployment is determined entirely by long-run supply factors and equals the NAIRU. But in the short-run, unemployment is determined by the interaction of aggregate demand and short-run aggregate supply" (p.16). One of the key properties of NiGEM is that in the long run, employment and output are determined by supply side factors only. Long-run economic growth is determined by the growth in the labour force and by technical progress. Nevertheless, demand shocks are an important determinant of economic activity in the short and longer term.

3.1.2 Household consumption, income and wealth

Consumption decisions are presumed to depend on real disposable income and real wealth in the long run, and follow the pattern discussed in Barrell and Davis (2007). Total wealth is composed of both financial wealth and tangible (housing) wealth where the latter data is available.

$$\ln(C) = \alpha + \beta\ln(RPDI) + (1-\beta)\ln(RFN + RTW) \tag{7}$$

where *C* is real consumption, *RPDI* is real personal disposable income, *RFN* is real net financial wealth and *RTW* is real tangible wealth. The dynamics of adjustment to the long run are largely data based, and differ between countries to take account of differences in the relative importance of types of wealth and of liquidity constraints.

3.1.3 Financial markets

We generally assume that exchange rates are forward looking and 'jump' when there is news. The size of the jump depends on the expected future path of interest rates and exchange rate risk premia, solving an uncovered interest parity condition, so that the expected change in the exchange rate is given by the difference in the interest earned on assets held in local and foreign currencies.

$$e_t = e_{t+1}\left(\frac{1+r_t^*}{1+r_t}\right)(1+rp_t)+w_t \tag{8}$$

where e_t is the bilateral exchange rate at time t (defined as domestic currency per unit of foreign currency), r_t is the short-term nominal interest rate at home set in line with a policy rule, r_t* is the interest rate abroad and rp_t is the exchange rate risk premium.

Interest rates are determined by policy rules adopted by monetary authorities as discussed in Barrell et al. (2006). Nominal short term interest rates are set in relation to a standard forward looking feedback rule[5]. Forward looking long-term interest rates (LR) are a forward convolution of expected short-term interest rates:

$$(1+LR_t) = \prod_{j=1}^{T}(1+r_{t+j})^{1/T} \tag{9}$$

We assume that equity markets are also forward looking, with equity prices determined by the discounted present value of expected profits, adjusted by an equity risk premium.

3.1.4 Public sector

We model corporate (*CTAX*) and personal (*TAX*) direct taxes and indirect taxes (*MTAX*) on spending, along with government spending on investment and on current consumption, and separately identify transfers and government interest payments. Each source of taxes has an equation applying a tax rate to a tax base (profits, personal incomes or consumption). As a default we have government spending on investment (*GI*) and consumption (*GC*) rising in line with trend output in the long run, with delayed adjustment to changes in the trend, and are re-valued in line with the consumers' expenditure deflator (*CED*). Government interest payments (*GIP*) are driven by a perpetual inventory of accumulated debts. Transfers to households (*TRAN*) are determined by the number of the working age population not in employment and the population above working age. Adjusted spending minus receipts gives us the budget deficit (*BUD*):

$$BUD = CED*(GC+GI)+TRAN+GIP-TAX-CTAX-MTAX \tag{10}$$

We have to consider how the government deficit (*BUD*) is financed. We allow either money (*M*) or bond finance (*DEBT*), so that the debt stock is related to historical deficits:

[5] Our default rule follows a 'two-pillar' strategy, targeting a combination of inflation and a nominal aggregate.

$$BUD_t = \Delta M_t + \Delta DEBT_t \quad (11)$$

rearranging gives:

$$DEBT_t = DEBT_{t-1} + BUD_t - \Delta M_t \quad (12)$$

In all policy analyses we use a tax rule to ensure that governments remain solvent in the long run (Barrell and Sefton, 1997). This ensures that the deficit and debt stock return to sustainable levels after any shock. A debt stock target can also be implemented. The tax rate equation is of the form:

$$TAXR = f(\text{target deficit ratio - actual deficit ratio}) \quad (13)$$

If the Government budget deficit ratio is greater than the target, (e.g. -3 % of GDP and target is -1% of GDP) then the effective income tax rate is increased.

Fiscal multipliers in response to direct and indirect tax adjustments are smaller compared to the multipliers arising from adjustments in government spending, as part of the movement in personal sector income driven by adjustment in taxes is offset by temporary adjustments in the saving rate while government spending instruments, such as government consumption or government investment, are part of the income identity and affect output directly.

3.1.5 External trade

International linkages come from patterns of trade, the influence of trade prices on domestic prices, the impacts of exchange rates and patterns of asset holding and associated income flows. The structure of the trade block ensures overall global consistency of trade volumes by imposing that the growth of import volumes is equal to the growth of export volumes at the global level. Trade volumes and prices are linked by Armington matrices, based on 2010 trade patterns. The volumes of exports and imports of goods and services are determined by foreign or domestic demand, respectively, and by competitiveness as measured by relative prices or relative costs.

$$\begin{aligned}\Delta XVOL = \alpha_1 - \lambda\left[XVOL_{-1} - S_{-1} + \beta_1 \frac{PXNCOM}{CPX}_{-1} + \beta_2 \frac{PXNCOM}{DPX}_{-1} \right] + \\ + \beta_3 \Delta S - \beta_4 \Delta \frac{PXNCOM}{CPX} - \beta_5 \Delta \frac{PXNCOM}{DPX}\end{aligned} \quad (14)$$

where XVOL is a volume of exports of goods and services, S is export market size, PXNCOM is export prices of non-commodities, CPX is a weighted average of competitor's export prices, and DPX is a weighted average of consumer prices in the exporting country's export markets.

$$\Delta MVOL = \alpha_1 - \lambda\left[MVOL_{-1} - 1.24TFE_{-1} + \beta_1 RPM_{-1}\right] + \beta_2 \Delta TFE - \beta_3 \Delta RPM \quad (15)$$

where MVOL is a volume of imports of goods and services, TFE is total final expenditure and RPM is relative import price. We impose a common demand elasticity across all countries of 1.24, based on panel estimation reported in Barrell and Dees (2005).

The export demand variable (S) is constructed as a weighted sum of other countries' imports, which ensures approximate balance, and any discrepancy is allocated to exports in proportion to the country's share of world trade.

$$S_j = \sum \beta_i XMVOL_i \tag{16}$$

where βi is given by (exports from country j to country i)/(total imports in country i). XMVOLi is imports of goods and services in country i, calculated in 2011 US$.

Import prices depend on a weighted average of global export prices, and this ensures that the ratio of the value of exports to the value of imports remains at around its historical level.

$$RPM = PM\ /(CED\ /(1 + ITR)) \tag{17}$$

where PM is an import deflator (goods and services), CED is a consumer expenditure deflator and ITR is indirect tax rate.

It is assumed that exporters compete against others who export to the same market as well as domestic producers via relative prices. The overall current balance depends upon the trade balance and net property income from abroad, which comprises flows of income onto gross foreign assets and outgoings on gross foreign liabilities. World flows of property income balance because all assets are matched by liabilities, while revaluations of liabilities match those of assets and income flows match payment flows.

3.2 Model assumptions

NiGEM incorporates a wide range of possible monetary and fiscal policy reaction functions as well as different assumptions regarding the way expectations are formed. In order to evaluate the effects of fiscal shocks and to ensure a proper comparison across scenarios we need to be clear about the underlying assumptions that we impose as well as making sure that the policy reactions do not contaminate the immediate responses of the economy to the established shocks. Our assumptions are listed below.

Policy reactions are turned off for the first year:

- The monetary authority does not change the interest rate for a year. Afterwards it follows a two pillar rule whereby it aims to stabilise both inflation and nominal output.
- NiGEM incorporates a feedback rule in the income tax equation that ensures that the government deficit returns to the target deficit in the medium term. This is switched off for a year.
- Government investment is held at the baseline level for a year and allowed to move according to its structure thereafter. The same, where appropriate, is true for government consumption.

In the model, market clearing holds and all quantities and prices are endogenous, with the exception of policy targets, labour supply, and risk premia:

- Financial markets are forward looking and the expectations they hold are consistent with the outturns.
    - Long-term government bond rates are the forward convolution of future short-term policy rates plus an exogenous premium.
    - Long-term interest rates are the forward convolution of future short-term real policy rates plus an exogenous risk premium made up of the bond premium plus private sector risks.
    - Equity prices are the discounted value of future profits, where the discount factor is the market interest rate plus the exogenous equity premium.
    - Exchange rates are described by an uncovered interest rate parity condition so that they can "jump" when future interest rates are expected to change.
- Labour markets are described by an exogenous labour supply, a labour demand equation and by a wage equation based on search theory, where the bargain depends on backward and forward looking inflation expectations.
- Capital stocks adjust slowly and accumulate as a function of a forward looking user cost of capital.
- Output capacity and factor demands are based on a CES production function.
- Consumers respond to their expectations of future financial wealth, but are not fully forward looking as they don't take the whole future into account.

4 Short-term fiscal spillover multipliers

Fiscal multipliers in NiGEM are small, usually below 1. This is largely due to two features of the model. Firstly, trade linkages imply that part of the fiscal impulse will be leaked away from the country via trade. Secondly, there are several policy switches that dampen the effects of a fiscal shock. Even if the short-term interest rate is constant for a year, as described in the previous section, the long-run rate will fall on impact creating an incentive for firms to invest and thus dampening the fall in output. Even so, the multipliers in NiGEM are likely to be overstated, as there may be lags in the implementation of a fiscal policy in the real world that are not fully captured in the model.

We consider four different types of fiscal shocks that last for one year: a government consumption shock, a government investment shock, an income tax shock and a value added tax (VAT) shock. We shock government consumption and investment by one per cent of baseline real GDP. The income tax and VAT shock are calibrated to produce an increase in income and indirect tax receipts of one per cent of baseline real GDP, respectively.

Each of the fiscal instruments transmits through the economy in a different way. Both government consumption and government investment have a direct impact on output as they are part of the national account identity. Government investment also affects capital accumulation which in turn affects potential output. However, as capital accumulates slowly the short-term output effect of government investment is very similar to that of government consumption. Both income tax and

VAT affect households' real disposable income. The former via a change in disposable income while the latter via the rate of consumer price inflation. Fiscal multipliers from government spending shocks are larger than the multipliers from changes in taxes, as the former impact output directly while part of the changes in real disposable income implied by the latter are saved away. An in-depth analysis and discussion of the transmission mechanisms of each fiscal instrument and their relation with fiscal multipliers within the context of NiGEM can be found in Al-Eyd and Barrell (2005).

Table 2. First-year GDP spillover multiplier (in %) from a 1% of GDP temporary fiscal contraction

Table 2a. Fiscal shock implemented in Germany

	Government spending		Taxes	
	Consumption	Investment	Income	VAT
Belgium	-0.21	-0.22	-0.14	-0.12
Finland	-0.11	-0.12	-0.08	-0.06
France	-0.09	-0.09	-0.06	-0.05
Germany	-0.46	-0.48	-0.31	-0.28
Greece	-0.14	-0.14	-0.09	-0.07
Ireland	-0.04	-0.04	-0.02	-0.01
Italy	-0.06	-0.06	-0.04	-0.03
Netherlands	-0.28	-0.29	-0.19	-0.16
Austria	-0.14	-0.15	-0.09	-0.07
Portugal	-0.12	-0.13	-0.08	-0.07
Spain	-0.05	-0.06	-0.04	-0.02

Table 2b. Fiscal shock implemented in France

	Government spending		Taxes	
	Consumption	Investment	Income	VAT
Belgium	-0.17	-0.17	-0.11	-0.04
Finland	-0.06	-0.06	-0.04	-0.01
France	-0.58	-0.59	-0.40	-0.15
Germany	-0.06	-0.06	-0.04	-0.01
Greece	-0.07	-0.08	-0.05	-0.01
Ireland	-0.02	-0.02	-0.01	0.00
Italy	-0.04	-0.04	-0.03	-0.01
Netherlands	-0.14	-0.14	-0.09	-0.03
Austria	-0.04	-0.05	-0.03	-0.01
Portugal	-0.11	-0.11	-0.07	-0.03
Spain	-0.05	-0.05	-0.03	-0.01

Note: No shift in the budget deficit target.

The Central Bank targets both inflation and nominal output stability. The interest rate response will therefore be dependent on the magnitude of the change, following the fiscal shock, in nominal output and inflation. All fiscal shocks affect nominal output to some degree, but the VAT shock has a much larger effect on consumer price inflation compared to the other shocks. Consequently, the VAT shock is likely to trigger the strongest response from the monetary policy authority, which will dampen the output response to the shock.

Table 2 provides the fiscal spillover multipliers, the percentage increase in output, that arise for each Euro Area country after implementing a contractionary fiscal shock in Germany, France, Italy and Spain. We report the multipliers arising for each of the fiscal shocks described above. The multipliers are obviously larger in the country where the shock takes place compared to the remaining countries. In Appendix A we report tables with the same information as Table 2 for all the countries included in the analysis as well as providing the time series path for a set of variables of interest.

Table 2. First-year GDP spillover multiplier (in %) from a 1% of GDP temporary fiscal contraction

Table 2c. Fiscal shock implemented in Italy

	Government spending		Taxes	
	Consumption	Investment	Income	VAT
Belgium	-0.08	-0.08	-0.01	-0.01
Finland	-0.04	-0.05	-0.01	0.00
France	-0.04	-0.04	-0.01	0.00
Germany	-0.04	-0.04	-0.01	0.00
Greece	-0.07	-0.08	-0.01	-0.01
Ireland	-0.01	-0.02	0.00	0.00
Italy	-0.55	-0.56	-0.11	-0.06
Netherlands	-0.09	-0.09	-0.02	-0.01
Austria	-0.04	-0.05	-0.01	0.00
Portugal	-0.05	-0.05	-0.01	0.00
Spain	-0.03	-0.03	0.00	0.00

Table 2d. Fiscal shock implemented in Spain

	Government spending		Taxes	
	Consumption	Investment	Income	VAT
Belgium	-0.05	-0.05	-0.01	0.00
Finland	-0.03	-0.03	0.00	0.00
France	-0.03	-0.03	0.00	0.00
Germany	-0.02	-0.02	0.00	0.00
Greece	-0.03	-0.03	0.00	0.00
Ireland	-0.01	-0.01	0.00	0.00
Italy	-0.02	-0.02	0.00	0.00
Netherlands	-0.05	-0.06	-0.01	-0.01
Austria	-0.02	-0.02	0.00	0.00
Portugal	-0.12	-0.13	-0.03	-0.02
Spain	-0.81	-0.82	-0.22	-0.19

Note: No shift in the budget deficit target.

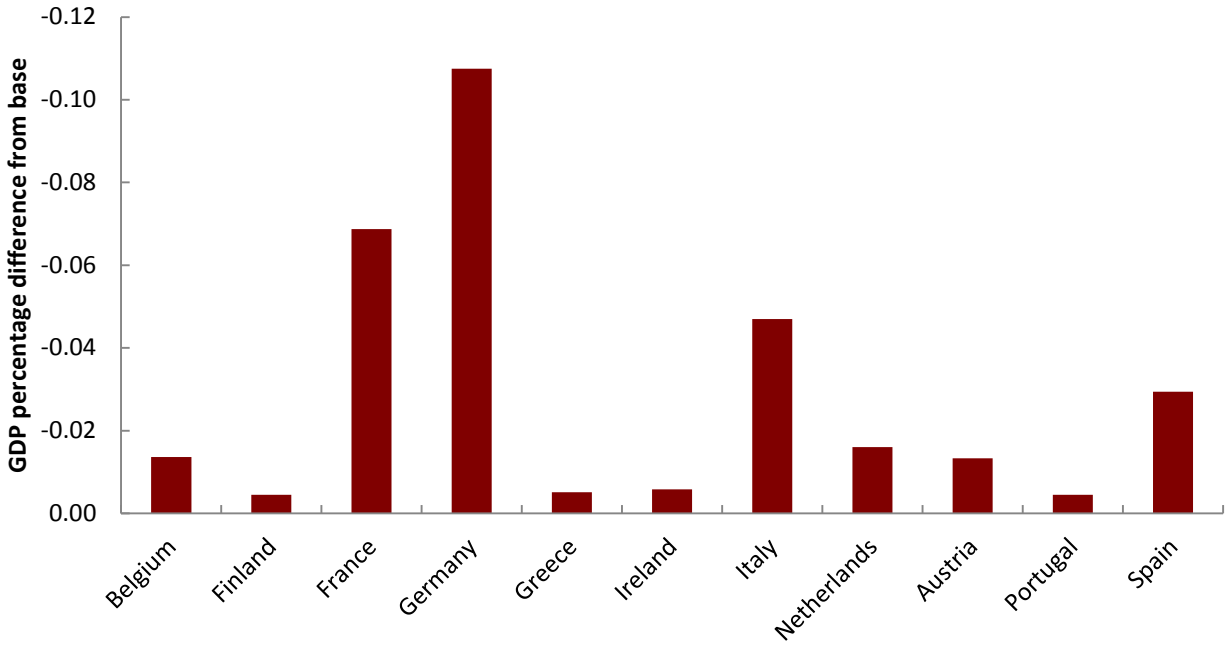
There is a lot of variation across countries. For the case where the shock is applied to Germany, the spillover multiplier ranges from 5 to around 50 per cent of the German fiscal multiplier. The spillover multipliers for the case of France are somewhat smaller, reflecting the smaller size of the French economy as well as a lower import penetration compared to Germany.[6] The same holds true for Italy

[6] Import penetration is defined as the percentage of imports over real GDP. In 2015, import penetration in Germany and France was 40 and 31 per cent, respectively.

and Spain. We can also see, as explained before, that fiscal spillover multipliers are larger in magnitude for the government spending shocks compared to the tax shocks.

We report the country level spillover multipliers that arise from fiscal shocks in the remaining EA countries in Appendix A. In addition, we report the spillover multipliers at the EA level for each of the countries included in the analysis. The results are displayed in Figure 1, where each bar represents the first year EA level GDP spillover multiplier following a 1 per cent of GDP temporary reduction of government consumption in a given country. The multiplier excludes the country where the shock has been implemented. We only report the results obtained from shocking government consumption as this produces, in general, larger multipliers than taxation shocks. As one can see, the effects are relatively small once we look beyond the biggest four EA countries.[7]

Figure 1. Euro Area first-year GDP spillover multiplier



Note: Each bar is the Euro Area, excluding the country named in the bar, first year multiplier that arises from a temporary reduction of government consumption by 1% of GDP applied, again, to the country named in each bar.

4.1 Regression analysis

In this section we investigate which variables help explain the observed variation in fiscal spillover multipliers. To do so, we run OLS regressions of the spillover multipliers originated by the German and French fiscal shocks on a set of controls. The set of covariates that we consider are a measure of trade linkages (TradeLink), defined as the share of imports of Germany or France that come from each other country of the sample, the short-term elasticity of imports to total final expenditure (TfeElas), an estimated parameter taken from NiGEM's import equations, the short-term elasticity of private consumption to real personal disposable income (ConsSens), again an estimated parameter taken from NiGEM's aggregate private consumption equation, openness to trade (Openness),

[7] These countries are, ordered by 2015 GDP (PPP), Germany, France, Italy and Spain.

defined as the share of imports over real GDP and country size (Size), defined as the country share EA real GDP in PPP terms.

These covariates are either estimates taken from NiGEM's equations, or data taken from NiGEM's database. The estimation of NiGEM's import equations, from which we have taken our measure of the short-term elasticity of imports to total final expenditure, is explained in detail in Barrell et al. (2007). Al-Eyd and Barrell (2005) provide the discussion of the estimation of the aggregate private consumption equations from where we take our estimates of the short-term elasticity of private consumption to real personal disposable income. Our measure of trade linkages comes from NiGEM's trade matrix, constructed using data from UNCTAD complemented with services data from OECD. The data used to construct the openness to trade covariate comes from national statistical offices and GDP values in PPP terms, used to compute the covariate Size, come from IMF World Economic Outlook Database (2011).

Tables 3a and 3b show the outcome of the regressions, in levels, for Germany and France. We report the outcome for each type of fiscal shock and provide two alternative specifications. The numbers in brackets are t-statistics. Looking at the results of the first specification, where we include all the covariates, we observe that the goodness of fit is good for the regression for Germany and slightly worse for France with adjusted R-squared of around 75 and 50 per cent, respectively. The test for the overall significance of the regression is rejected in Table 3b. That the fit is worse for the regression using the spillovers arising from shocks in France does not come as a surprise given the lower variation in the observed spillover multipliers, a phenomenon particularly acute when looking at the spillovers from the VAT shock (see Table 3b). In addition, several covariates appear to be not statistically significantly different from zero.

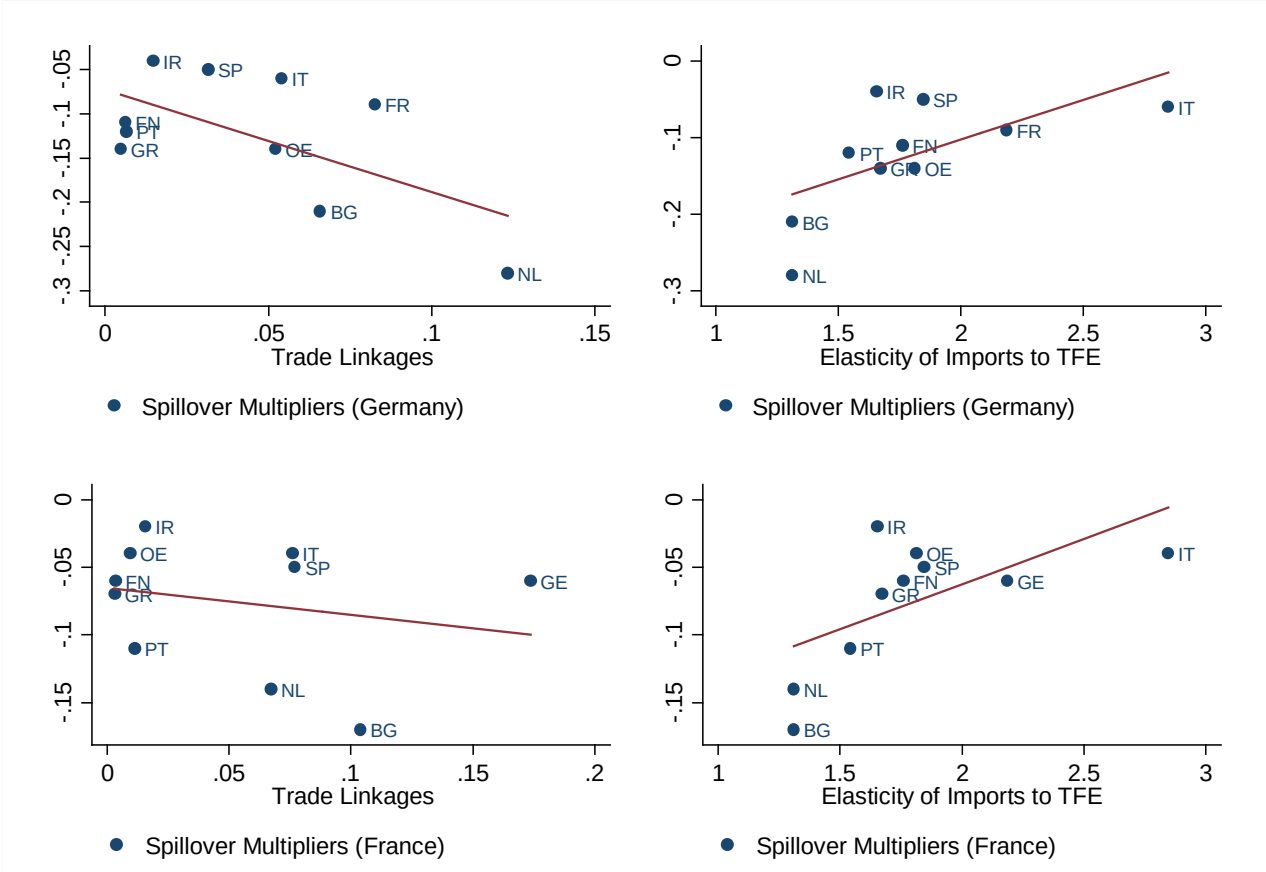
The signs of the coefficients appear to be in the right direction. We obtain, as expected, that those countries that experience larger volumes of trade with Germany or France experience larger spillover multipliers. Countries where the elasticity of imports to total final expenditure is larger experience smaller multipliers. A fall in, say, German imports translates into a fall in exports of the other countries. Those countries with higher elasticities of imports to final expenditure, which includes exports, will thus experience larger falls in import volumes thus dampening the effect on domestic output. Ideally, the results should be driven by the import intensity of each country's exports. However, our import equations do not have this level of disaggregation and only include total final expenditure. In Section 6 we tackle this issue by expanding our import equations to decompose total final expenditure into its subcomponents, including exports. Countries with higher sensitivity of private consumption to changes in real income have bigger multipliers, as the fall in income driven by the fall in exports generates a higher fall in private consumption. Those countries more open to trade experience lower multipliers, as part of the fall in output is matched by a larger fall in imports. Finally, we conclude that larger countries experience smaller multipliers, possibly a result driven by the fact that larger countries tend to be less open to trade.

The second specification, our preferred one for its simplicity, goodness of fit and ease of interpretation, keeps only two covariates: our measure of trade linkages and the elasticity of imports to total final expenditure. Our view is that the effects of higher sensitivity of private consumption to changes in real income are important when quantifying the magnitude of fiscal multipliers but are of second order importance when looking at spillovers, as movements in real disposable income of

consumers in those countries are only affected indirectly via movements in real activity through trade fluctuations. Our choice of not including the openness to trade covariate is motivated by our view that TradeLink captures trading patterns relevant for the propagations of spillovers in a more accurate way, as well as capturing in an indirect way whether a country is open to trade or not. For instance, Netherlands and Belgium are both countries highly open to trade as well as has having strong trade connections with both Germany and France. We do not include Size, as it is also highly correlated with openness to trade. As one can see, the estimated coefficients have the expected sign, the loss of goodness of fit from disregarding the other covariates is relatively small – two covariates alone explain 2/3 of the total observed variance in spillover multipliers for the German case - and the test for the overall significance of the regression improves dramatically in both cases; the F-test in Table 3b cannot be rejected at the 10 per cent significance level anymore. In addition, we find that our selection of controls is intuitive from an economic perspective.

Figure 2 illustrates the strength of the correlations captured in the second regression specification by providing a scatter plot of each covariate against the spillover multipliers that arise from a government consumption shock for both Germany and France.

Figure 2. Scatter plot. Covariates against spillover multipliers.



Note: The top two charts plot the spillover multipliers from Table 3a against covariates from the second specification. The next two charts plot the spillover multipliers from Table 3b against the covariates from the second specification.

Table 3a. Germany: OLS regression outcome with spillover multipliers as a dependent variable

	Specification 1				Specification 2			
	Government Spending		Taxes		Government Spending		Taxes	
	Consumption	Investment	Income	VAT	Consumption	Investment	Income	VAT
TradeLink	-2.0104	-2.0672	-1.3572	-1.2027	-1.1207	-1.1338	-0.7637	-0.6950
	[-4.52]	[-4.76]	[-4.45]	[-3.81]	[-3.02]	[-2.99]	[-3.01]	[-2.99]
TfeElast	0.0402	0.0491	0.0343	0.0295	0.1014	0.1078	0.0676	0.0594
	[0.86]	[1.08]	[1.07]	[0.89]	[3.15]	[3.27]	[3.07]	[2.94]
ConsSens	-0.0271	-0.0036	-0.0041	-0.0030	-	-	-	-
	[-0.31]	[-0.04]	[-0.07]	[-0.05]	-	-	-	-
Openness	0.1214	0.1371	0.0955	0.0787	-	-	-	-
	[1.79]	[2.08]	[2.06]	[1.65]	-	-	-	-
Size	0.0003	0.0003	0.0002	0.0002	-	-	-	-
	[2.50]	[2.61]	[2.32]	[1.94]	-	-	-	-
Constant	-0.2260	-0.2604	-0.1726	-0.1399	-0.2564	-0.2733	-0.1707	-0.1419
	[-2.31]	[-2.73]	[-2.58]	[-2.02]	[-4.14]	[-4.31]	[-4.03]	[-3.65]
R-squared (%)	90.7	91.6	90.5	87.5	73.6	74.2	73.1	72.1
Adj R-squared (%)	79.2	81.5	78.7	71.8	66.1	66.8	65.4	64.1
F-test	0.0341	0.0273	0.0357	0.0603	0.0094	0.0087	0.0101	0.0115
Num. Observations	10	10	10	10	10	10	10	10

Note: Regressions run in levels. Numbers in brackets represent t-statistics.

Table 3b. France: OLS regression outcome with spillover multipliers as a dependent variable

	Specification 1				Specification 2			
	Government Spending		Taxes		Government Spending		Taxes	
	Consumption	Investment	Income	VAT	Consumption	Investment	Income	VAT
TradeLink	-1.4923	-1.5031	-1.0256	-0.3663	-0.3788	-0.3437	-0.2325	-0.0863
	[-2.18]	[-2.22]	[-2.20]	[-1.87]	[-1.69]	[-1.55]	[-1.53]	[-1.28]
TfeElast	0.0346	0.0305	0.0144	0.0095	0.0799	0.0792	0.0484	0.0182
	[0.65]	[0.58]	[0.40]	[0.62]	[2.86]	[2.86]	[2.56]	[2.17]
ConsSens	0.0207	0.0022	0.0001	0.0209	-	-	-	-
	[0.23]	[0.02]	[0.00]	[0.83]	-	-	-	-
Openness	0.0913	0.0957	0.0640	0.0260	-	-	-	-
	[1.36]	[1.45]	[1.40]	[1.35]	-	-	-	-
Size	0.0003	0.0003	0.0002	0.0001	-	-	-	-
	[1.47]	[1.59]	[1.58]	[1.16]	-	-	-	-
Constant	-0.1779	-0.1742	-0.1034	-0.0474	-0.1988	-0.2016	-0.1244	-0.0440
	[-1.69]	[-1.68]	[-1.44]	[-1.57]	[-4.02]	[-4.11]	[-3.71]	[-2.97]
R-squared (%)	78.4	78.2	75.4	74.0	56.3	55.7	50.9	42.7
Adj R-squared (%)	51.3	50.1	44.7	41.5	43.8	43.0	36.9	26.3
F-test	0.1621	0.1648	0.2022	0.2228	0.0550	0.0581	0.0829	0.1422
Num. Observations	10	10	10	10	10	10	10	10

Note: Regressions run in levels. Numbers in brackets represent t-statistics.

4.2 Propagation mechanisms

There are at least three possible channels, excluding migration flows, through which a shock in one country can have an effect on the other countries: via exchange rates, interest rates and trade. In our current analysis the exchange rate channel is not operating due to the common monetary policy in the Euro Area. Therefore, the spillover effects from a country implementing contractionary fiscal policies to the remaining countries must either come from the effect of the fiscal shock on the interest rate set by the ECB or by the impact through trade, either via volumes or prices. We expect the effects of the interest rate and trade channels on the magnitude of the fiscal spillover multipliers to be of opposite sign, as the ECB will move the intervention rate in order to stabilize the fluctuations in output. To disentangle both effects we run the exact same simulations as in Table 2 but keep the interest rate constant at the baseline level for five years instead of one so that the reaction of the long rate becomes much more muted. Table 4 provides the percentage change (increase if it is a positive number, decrease if negative) in the fiscal multiplier that would have happened had interest rates been fixed for five years.

Table 4. Percentage change in spillover multipliers had interest rates been constant

	Government spending		Taxes	
	Consumption	Investment	Income	VAT
Belgium	6.0	5.4	6.8	11.3
Finland	7.9	7.0	9.0	15.2
France	8.1	7.1	9.2	16.3
Greece	6.9	6.1	7.9	13.5
Ireland	32.1	27.6	38.0	87.0
Italy	11.0	9.7	12.7	23.4
Netherlands	3.6	3.2	4.1	6.5
Austria	6.3	5.7	7.3	13.0
Portugal	4.6	4.0	5.1	8.4
Spain	13.5	11.8	15.7	33.9

Note: Germany excluded as it is the country where the shock has been implemented

It can be seen from Table 4 that trade is the predominant channel shaping fiscal spillover multipliers. As expected, fiscal multipliers would have been larger had interest rates not moved, but the difference is relatively small; in most cases less than ten per cent. The magnitude of the multipliers would have been larger because the monetary policy rule stabilizes fluctuations in output and inflation. Following the fall in output due to the fiscal contraction, the ECB decreases the interest rate to dampen the fluctuation in GDP. The effects from the interest rate channel are larger under the VAT scenarios than in the others, which is to be expected given that a VAT shock has a much larger pass-through to consumer prices than the other fiscal shocks. We also observe that there is a lot of variation across countries. Ireland, for instance, is affected by the interest rate channel much more than Netherlands, for example. This could reflect country idiosyncrasies, but most likely is driven by the lower starting base. In fact, those countries with the largest effect from the interest rate channel, Ireland, Italy and Spain, are also the countries that have smaller fiscal spillover multipliers.

5 Short-term fiscal spillover multipliers in 'crisis times'

In a world where the assumption of perfect capital markets holds, agents' consumption and investment decisions can be decoupled from their income profile so long as the present discounted value of their spending profile equals that of their income[8]. Agents can simply borrow against their future income. Under this assumption, aggregate consumption would be unaffected by fluctuations in current income. However, some agents cannot gain access to credit even when they should be able to given their future stream of income. There are several reasons to explain this phenomenon but most of them fall into the category of problems related with imperfect information. Following the literature we call these agents credit or liquidity constrained individuals. Agents who cannot borrow against their future income rely much more on their current income which implies that aggregate consumption will also be more reactive to movements in income in the presence of liquidity constrained agents.

The sensitivity of aggregate consumption to current income may fluctuate over the business cycle as the share of agents who face credit constraints moves. For instance, Barrell et al. (2006) suggest that the proportion of agents and firms with liquidity constraints increased over the previous financial crisis. Fiscal multipliers, in turn, will also be affected by the proportion of liquidity constrained agents, as falls in firms' profits and households' disposable income triggered by the fiscal shock will translate into a stronger fall in consumption or investment.

In this section we will look at how fiscal spillover multipliers change when the share of liquidity constrained agents increases as would happen during a recession. Following Al-Eyd and Barrell (2005), we model "crisis times" as a period with a higher sensitivity of aggregate consumption and investment to short term fluctuations in income to account for a larger proportion of liquidity constrained individuals. The consumption equation in NiGEM is of the following form:

$$\begin{aligned}\Delta \log(C_t) = \lambda\{\log(C_{t-1}) - [a + b_0 \log(TW_{t-1}) + (1 - b_0)\log(RPDI_{t-1})]\} \\ + b_1 \Delta \log(RPDI_t) + b_2 \Delta \log(NW_t) + b_3 \Delta \log(HW_t),\end{aligned} \tag{18}$$

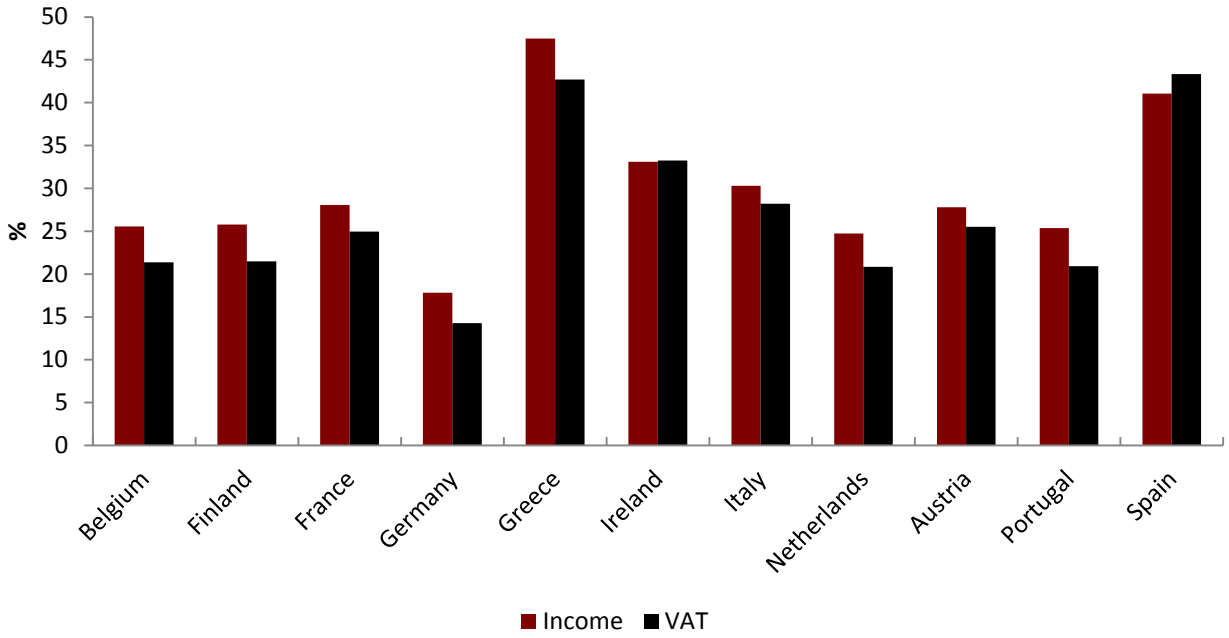
where C is consumption, TW is total asset wealth which includes net financial wealth (NW) and tangible wealth (HW) and RPDI is real personal disposable income. Δ is the difference operator, subscript t denotes the time period and the remaining symbols are parameters. The term within the curly brackets captures the long-term behaviour of aggregate consumption, while the remaining terms capture short-run dynamics. The parameter b_1 captures the sensitivity of aggregate consumption to changes in current real disposable income and, as suggested by Al-Eyd and Barrell (2005), it represents a proxy of the share of people subject to liquidity constraints in the economy. To approximate a 25 per cent increase in the share of liquidity constraint agents, we increase b_1 by 25 per cent across all countries in the Euro Area to capture a situation with heightened turmoil in the banking sector.

In crisis times firms also face difficulties obtaining funding, not only households. To capture an increase in the share of firms who face liquidity constraints we will follow the same approach as with households and increase the parameter in the investment equation that captures the sensitivity of investment to changes in current income. As with the household sector, we will consider a 25 per cent increase in the value of the parameter.

[8] This is a variation of the Fisher separation theorem.

Figure 3 presents the percentage increase in the spillover multipliers that arise from the income tax and VAT shocks in Germany when households and firms of all countries in the Euro Area face higher liquidity constraints. Appendix B provides similar information for France as well as including the percentage increases in multipliers that result from varying the increase in the proportion of agents that are liquidity constrained. Government consumption and investment shocks affect real household income only indirectly and the proportion of liquidity constrained agents in the economy has little effect on fiscal spillovers. Direct tax rate and VAT shocks affect real household income directly and the effect of liquidity constraints is more significant. Thus we only report percentage increases in fiscal spillover multipliers arising from direct tax rate and VAT shocks.

Figure 3. Spillover multipliers: percentage increase from spillovers reported in Table 2



Note: As Germany is the country where the fiscal shock is applied, the figure reported for Germany is the fiscal multiplier rather than the spillover multiplier.

Spillovers increase by around 20 to 50 per cent (which in the context of a fiscal contraction shock means that output falls by more) once we account for an increase in the share of agents facing liquidity constraints. As taxes increase in Germany, households and firms adjust their spending plans. Given a higher proportion of agents relying on their current income, there is a stronger fall in spending compared to the baseline case as agents find themselves unable to borrow against future income to smooth consumption and investment. As a consequence, German imports fall by a larger extent which impacts Germany's trading partners.

6 Re-calibration of import equations

A recent strand of the literature concerned with the recent trade growth slowdown has suggested that the phenomena could be explained by movements over time of the elasticity of imports to changes in total final expenditure (see NIER, 2016 for a comprehensive overview). A shift in the composition of total final

expenditure towards low import intensive components should put downward pressure on the growth of trade volumes as similar magnitudes of final expenditure would command lower volumes of imports and consequently, of trade. This literature highlights that average estimates of elasticities of imports to total final expenditure mask important variation in import intensities across the components of total final expenditure and that compositional effects may affect the average elasticity over time. Both elements are of relevance to our present analysis as the magnitude of fiscal multipliers and fiscal spillovers are sensitive to estimates of the import sensitivity of total final expenditure (see for instance, Ivanova and Weber 2011).

A recent paper by Bussière et al. (2013) that makes use of data from the Input-Output tables of the OECD shows that there is indeed a lot of variation in the import content of each component of total final expenditure (TFE). In general, exports and investment are more import intensive than private consumption and private consumption, in turn, is more import intensive than public consumption. As a consequence, it is likely that the magnitude of spillover multipliers be a function of the components of total final expenditure. According to the data from Input-Output tables, fiscal shocks to public expenditure should have a smaller effect on imports, and therefore on everyone else's exports, than shocks that affect private investment, as the import content of public consumption is smaller than that of investment.

Import equations in NiGEM are of the following form:

$$\begin{aligned}\Delta \log(MVOL_t) \; &= \alpha_0 - \lambda[\log(MVOL_{t-1}) - \beta_0 \log(TFE_{t-1}) + \beta_1 \log(RPM_{t-1})] - \alpha_1 \log(RPM_t) \\ &+ \alpha_2 \Delta \log(TFE_t),\end{aligned} \tag{19}$$

where MVOL, TFE, and RPM denote imports, total final expenditure, and real import prices, respectively. The term in square brackets represents the long-term dynamics of imports while the remaining terms capture additional short-term fluctuations.

The estimation of the import equations in NiGEM is discussed in Barrell et al. (2007), where trade volume equations are modelled as demand relationships, with the total level of imports depending on the level of a demand indicator for the relevant economies and on relative prices. This is the approach developed for European trade equations in Barrell and te Velde (2002) who discuss standard macroeconomic demand relationships for estimating export and import volumes. We follow the methodology of Bussière et al. (2013) to calculate the import intensities of each component of total final expenditure and decompose total final expenditure into government consumption, private consumption, gross fixed capital formation, and exports. We also add a fifth category, stockbuilding and the residual in the national account identity, which, given that it is not clear what this group is composed of, we choose to give it an import intensity equivalent to the average of the import intensities of the previous four components. We normalize the estimates of import intensities to one. As in Bussière et al. (2013), we use data from the Input-Output tables of the OECD (2005 data vintage). Appendix C lists the estimated values of the import intensity coefficients for all the countries included in the analysis after the normalization. Our estimation of the import intensity of exports also takes into account the import component of re-exports. All the results shown below are little changed by removing re-exports from the calculation of the import intensities.

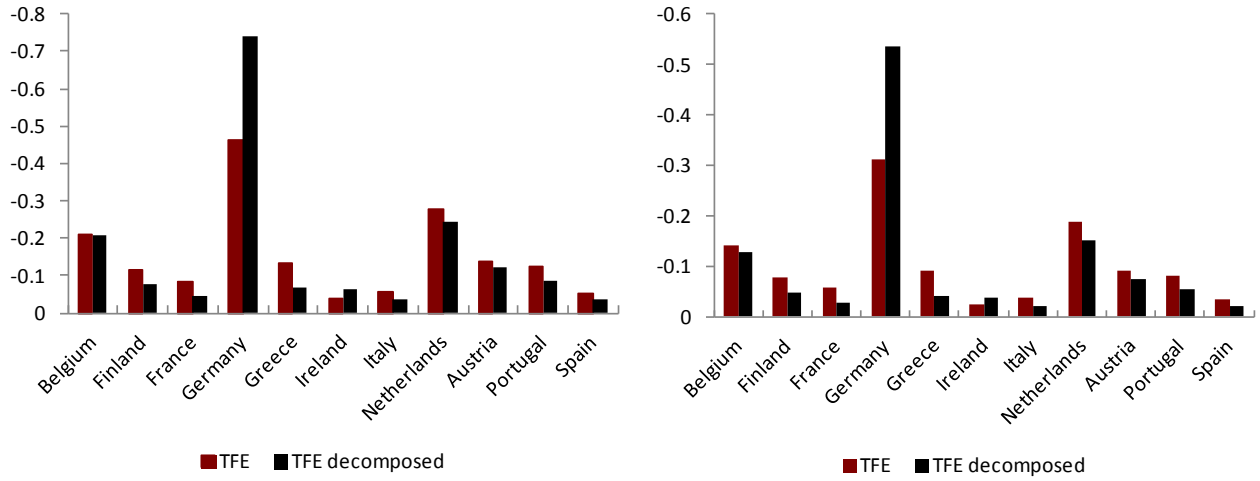
The resulting import equations that we re-estimate have the following form:

$$\begin{aligned}\Delta \log(MVOL_t) \; &= \alpha_0 - \lambda[\log(MVOL_{t-1}) - \beta_0 \log(TFE_{t-1}) + \beta_1 \log(RPM_{t-1})] - \alpha_1 \log(RPM_t) \\ &+ \alpha_2[\omega_0 \Delta \log(GC_t) \\ &+ \omega_1 \Delta \log(C_t) + \omega_2 \Delta \log(GFCF_t) + \omega_3 \Delta \log(XVOL_t) + \omega_4 \Delta \log(DS_t + RES_t)],\end{aligned} \tag{20}$$

where GC, C, GFCF, XVOL, DS, and RES denote government consumption, private consumption, gross fixed capital formation, exports, stockbuilding, and residual component of national accounts, respectively.

We run the exact same shocks as we did in Table 2 with the new import equations and compare the results that we obtain with the ones reported in Table 2. The results are shown in Figure 4. We report the results from shocks on government consumption spending and income tax for Germany here and the results for the remaining EA countries in Appendix D.

Figure 4. Germany: Comparison of spillover multipliers from a 1 per cent of GDP fiscal contraction.



Note: The panel on the left corresponds to the results following a shock on government consumption while the one on the right to the results from an income tax rate shock. The values for Germany correspond to the fiscal multiplier rather than a spillover as Germany is the country where the shock takes place.

The modification of the import equations produces an increase in the magnitude of the fiscal multiplier in Germany and a decrease of the fiscal spillover multiplier of all the remaining countries, except for Ireland. Once we decompose TFE into its components and allow import intensities to vary, we find that government and private consumption have lower import elasticities than the ones implied by the baseline import equation. As a result, the fall in public and private consumption in Germany following the contraction in government spending or the increase in income taxes induce a smaller reduction of imports, which translates into an increased impact of the fiscal shock on German output. As German imports fall by less than in our baseline scenario, everyone else's exports also fall by less. As a consequence, spillover effects on Germany's trading partners are attenuated.

The change introduced in NiGEM's import equations has a significant impact on the magnitude of the fiscal multipliers. Nevertheless, the fundamental message remains: fiscal shocks permeate through to other countries and the magnitudes do not seem negligible.

7 Conclusions

This paper looks at the spillover effects following a fiscal contraction plan implemented in one Euro Area country at a time, with a particular focus on Germany. Our findings suggest that first year fiscal spillover

multipliers from a 1 per cent of GDP temporary fiscal shock in Germany range between 0.01 to 0.3 per cent of each country's GDP. The Euro Area wide spillover multiplier, excluding Germany, is 0.11 per cent. Our results indicate that fiscal spillovers from government spending shocks are larger than from revenue shocks and also find that the main propagation mechanism across the Euro Area of the fiscal plans implemented in Germany work via trade flows rather than through movements in the ECB's policy intervention rate.

We analyse the sensitivity of the spillover multipliers to changes in the proportion of agents that face liquidity constraints, an exercise that proxies the downturn phase of the business cycle. Our findings suggest that the percentage increase of the spillover multipliers ranges from 20 to 50 per cent when we proxy for an increase in the proportion of liquidity constraint agents of 25 per cent.

Our estimates of the spillover multipliers are attenuated if we expand our import equations by decomposing total final expenditure in its subcomponents. Our results show that public and private consumption are less import intensive than the average import intensity of total final expenditure which implies that the impact on trade of a fiscal shock in Germany is muted, thus reducing the magnitude of the spillovers.

Several relevant areas of research are left to explore including spillovers arising from international coordination of fiscal policy, the role of monetary policy in shaping the size of fiscal multipliers and fiscal spillover multipliers, both in the sense of whether the Central Bank accommodates the fiscal stance and the rule that the Central Bank follows, a comparison of fiscal multipliers from temporary and permanent shocks, the role of expectations of future consolidation plans and the relationship between fiscal consolidation plans and the risk premia. We aim to address some of these areas in a forthcoming paper written under the FIRSTRUN research grant deliverable 2.4. This paper will explore in detail the fiscal multiplier within a number of European economies, and as such provides a useful complement to this paper.

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Appendix A

The following set of tables report the simulated time path of a selection of variables following a fiscal shock in each Euro area country included in the present analysis. Included in the selection of variables are the spillover multipliers to the remaining Euro area countries. The units are either in percentage or absolute difference from baseline values. The title reports the country where the fiscal shock has taken place as well as the type of fiscal shock applied.

Government consumption shock

Table 5. Belgium, temporary government consumption shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.45	0.04	0.03	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.00
Real consumption	-0.04	-0.03	0.00	0.01	0.01	0.02	0.03	0.03	0.04	0.04	0.05
Real investment	-0.54	0.59	0.18	0.06	0.02	0.01	0.00	-0.01	-0.01	-0.01	-0.01
Real exports	-0.04	0.02	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Real imports	-0.80	0.09	0.03	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.02
Output gap (per cent of GDP)*	-0.33	0.05	-0.03	-0.03	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
Current account (per cent of GDP)*	0.69	-0.06	-0.01	0.00	0.01	0.00	0.00	0.00	-0.01	-0.01	-0.02
Real effective exchange rate	-0.01	-0.05	-0.05	-0.05	-0.04	-0.02	-0.01	0.01	0.02	0.03	0.03
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.00	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.02	-0.04	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Consumer expenditure deflator	-0.02	-0.06	-0.06	-0.05	-0.04	-0.03	-0.01	0.00	0.01	0.02	0.03
GDP deflator	0.01	-0.02	-0.03	-0.02	0.00	0.01	0.02	0.04	0.05	0.06	0.07
Policy interest rate*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP*	-0.87	0.01	-0.01	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00
Government debt (per cent of GDP)*	-0.07	-0.82	-0.80	-0.77	-0.76	-0.75	-0.75	-0.74	-0.73	-0.72	-0.70
Spillovers: Real GDP level											
Finland	-0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.05	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: All numbers reported are in percentage difference from base, unless indicated otherwise. * denotes the number is reported as absolute difference from base. A positive number for government deficit represents an increase in the deficit. A positive number in the exchange rate variables denotes an appreciation of the currency. Spillovers to the Euro Area include the effect on the country being shocked.

Table 6. Finland, temporary government consumption shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.62	-0.03	0.02	0.04	0.03	0.02	0.02	0.02	0.01	0.01	0.01
Real consumption	-0.05	-0.07	-0.03	-0.03	-0.03	-0.02	-0.01	0.01	0.02	0.03	0.03
Real investment	-0.86	0.43	0.30	0.18	0.10	0.05	0.02	0.00	-0.01	-0.01	-0.01
Real exports	-0.02	0.02	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Real imports	-1.37	0.18	0.04	-0.04	-0.07	-0.07	-0.05	-0.02	-0.01	0.01	0.02
Output gap (per cent of GDP)*	-0.52	-0.02	-0.03	0.00	0.04	0.05	0.02	0.00	0.00	0.01	0.01
Current account (per cent of GDP)*	0.63	-0.06	0.01	0.02	0.02	0.02	0.02	0.02	0.01	0.00	0.00
Real effective exchange rate	-0.05	-0.18	-0.19	-0.14	-0.09	-0.06	-0.04	-0.02	0.00	0.02	0.03
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.06	-0.13	0.00	0.05	0.05	0.03	0.02	0.02	0.02	0.01	0.01
Consumer expenditure deflator	-0.06	-0.19	-0.19	-0.14	-0.09	-0.06	-0.04	-0.02	0.00	0.02	0.03
GDP deflator	-0.04	-0.17	-0.18	-0.13	-0.08	-0.05	-0.02	0.00	0.02	0.04	0.04
Policy interest rate*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP*	-0.92	0.03	-0.04	0.00	0.01	0.00	-0.01	-0.01	0.00	0.00	0.00
Government debt (per cent of GDP)*	-0.16	-0.73	-0.77	-0.79	-0.77	-0.75	-0.74	-0.73	-0.72	-0.70	-0.68
Spillovers: Real GDP level											
Belgium	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 7. France, temporary government consumption shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.58	0.00	0.02	0.03	0.03	0.03	0.03	0.04	0.04	0.03	0.03
Real consumption	-0.12	-0.10	-0.02	-0.01	0.00	0.00	0.01	0.02	0.04	0.05	0.06
Real investment	-0.58	0.50	0.29	0.15	0.08	0.05	0.04	0.03	0.02	0.01	0.00
Real exports	-0.17	0.14	0.14	0.11	0.08	0.06	0.04	0.03	0.02	0.00	-0.01
Real imports	-1.94	0.25	0.21	0.12	0.06	0.02	0.00	-0.01	-0.01	0.00	0.00
Output gap (per cent of GDP)*	-0.42	0.04	-0.04	-0.04	-0.01	0.01	0.01	0.02	0.02	0.02	0.02
Current account (per cent of GDP)*	0.56	-0.06	-0.04	-0.03	-0.02	-0.01	0.00	0.00	0.01	0.01	0.00
Real effective exchange rate	-0.04	-0.15	-0.17	-0.15	-0.12	-0.09	-0.07	-0.04	-0.02	0.00	0.02
Nominal effective exchange rate	0.00	-0.01	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	-0.01	-0.05	-0.05	-0.05	-0.04	-0.03	-0.02	-0.01	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	-0.02	-0.02	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.01	0.01
Headline CPI Inflation*	-0.06	-0.13	-0.01	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02
Consumer expenditure deflator	-0.06	-0.19	-0.20	-0.17	-0.14	-0.11	-0.08	-0.05	-0.03	-0.01	0.01
GDP deflator	-0.06	-0.21	-0.22	-0.19	-0.15	-0.12	-0.08	-0.05	-0.02	0.01	0.03
Policy interest rate*	0.00	-0.03	-0.02	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP*	-0.79	0.02	-0.04	0.00	0.01	0.00	0.00	-0.01	-0.01	0.00	0.00
Government debt (per cent of GDP)*	0.13	-0.53	-0.57	-0.60	-0.61	-0.63	-0.64	-0.66	-0.68	-0.69	-0.70
Spillovers: Real GDP level											
Belgium	-0.17	0.04	0.04	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Finland	-0.06	0.04	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Germany	-0.06	0.02	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Greece	-0.07	0.02	0.03	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00
Ireland	-0.02	-0.02	-0.01	0.00	0.01	0.01	0.01	0.02	0.01	0.01	0.01
Italy	-0.04	-0.01	0.01	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.14	0.05	0.06	0.04	0.02	0.01	0.01	0.01	0.01	0.01	0.00
Austria	-0.04	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Portugal	-0.11	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01
Spain	-0.05	-0.04	0.03	0.04	0.03	0.01	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.18	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01

Notes: see table 5.

Table 8. Germany, temporary government consumption shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.46	0.02	0.03	0.03	0.04	0.04	0.04	0.04	0.03	0.02	0.01
Real consumption	-0.11	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.03	0.04	0.04
Real investment	-0.50	0.52	0.21	0.09	0.05	0.02	0.00	-0.02	-0.03	-0.03	-0.03
Real exports	-0.27	0.19	0.18	0.13	0.10	0.07	0.04	0.02	0.00	-0.01	-0.02
Real imports	-1.90	0.39	0.24	0.13	0.06	0.01	-0.02	-0.03	-0.03	-0.03	-0.02
Output gap (per cent of GDP)*	-0.40	0.00	0.00	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.01
Current account (per cent of GDP)*	0.71	-0.09	-0.05	-0.03	-0.01	0.01	0.01	0.02	0.02	0.02	0.01
Real effective exchange rate	-0.07	-0.20	-0.18	-0.17	-0.13	-0.09	-0.05	-0.01	0.02	0.04	0.06
Nominal effective exchange rate	0.01	-0.01	-0.02	-0.01	-0.01	0.00	0.00	0.00	0.01	0.01	0.01
EA wide real effective exchange rate	-0.02	-0.08	-0.08	-0.07	-0.05	-0.04	-0.02	-0.01	0.00	0.01	0.01
EA wide nominal effective exchange rate	0.01	-0.03	-0.03	-0.03	-0.02	-0.01	0.00	0.01	0.01	0.01	0.01
Headline CPI Inflation*	-0.10	-0.16	0.02	0.03	0.04	0.04	0.04	0.04	0.03	0.03	0.02
Consumer expenditure deflator	-0.10	-0.25	-0.23	-0.21	-0.17	-0.13	-0.09	-0.05	-0.01	0.01	0.03
GDP deflator	-0.11	-0.30	-0.27	-0.24	-0.19	-0.14	-0.08	-0.03	0.01	0.05	0.07
Policy interest rate*	0.00	-0.04	-0.03	-0.02	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP*	-0.92	0.00	0.00	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00
Government debt (per cent of GDP)*	-0.03	-0.64	-0.65	-0.67	-0.70	-0.73	-0.75	-0.77	-0.79	-0.79	-0.79
Spillovers: Real GDP level											
Belgium	-0.21	0.07	0.06	0.04	0.02	0.01	0.00	0.00	0.00	0.00	0.00
Finland	-0.11	0.07	0.05	0.03	0.02	0.02	0.01	0.01	0.01	0.00	0.00
France	-0.09	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Greece	-0.14	0.03	0.06	0.04	0.02	0.01	0.01	0.01	0.00	0.00	0.00
Ireland	-0.04	-0.04	-0.02	0.00	0.01	0.02	0.02	0.02	0.02	0.02	0.02
Italy	-0.06	-0.01	0.02	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00
Netherlands	-0.28	0.08	0.09	0.06	0.04	0.02	0.01	0.00	0.00	0.00	0.00
Austria	-0.14	-0.04	-0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
Portugal	-0.12	0.05	0.05	0.04	0.03	0.03	0.03	0.02	0.02	0.01	0.01
Spain	-0.05	-0.02	0.04	0.05	0.04	0.02	0.01	0.00	0.00	0.00	0.00
Euro Area	-0.21	0.02	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.01	0.01

Notes: see table 5.

Table 9. Greece, temporary government consumption shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.94	0.19	0.16	0.13	0.09	0.06	0.05	0.04	0.03	0.01	0.00
Real consumption	-0.21	0.05	0.14	0.13	0.09	0.07	0.08	0.09	0.10	0.10	0.09
Real investment	-5.09	3.12	1.03	0.30	0.03	-0.05	-0.06	-0.06	-0.07	-0.08	-0.07
Real exports	-0.02	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Real imports	-1.88	0.56	0.25	0.06	-0.05	-0.07	-0.04	0.00	0.03	0.06	0.08
Output gap (per cent of GDP)*	-0.74	0.14	0.01	0.04	0.09	0.09	0.06	0.03	0.01	0.01	0.01
Current account (per cent of GDP)*	0.65	-0.20	-0.09	-0.02	0.02	0.03	0.02	0.01	0.00	-0.01	-0.02
Real effective exchange rate	-0.06	-0.19	-0.19	-0.13	-0.08	-0.04	0.00	0.03	0.06	0.09	0.10
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.06	-0.13	0.01	0.05	0.05	0.04	0.04	0.03	0.03	0.02	0.01
Consumer expenditure deflator	-0.06	-0.20	-0.19	-0.13	-0.08	-0.04	0.00	0.03	0.06	0.09	0.10
GDP deflator	-0.02	-0.15	-0.15	-0.09	-0.04	0.01	0.05	0.08	0.11	0.14	0.15
Policy interest rate*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP*	-0.69	-0.02	-0.06	0.00	0.02	0.01	0.00	-0.01	0.00	0.00	0.00
Government debt (per cent of GDP)*	1.38	-0.75	-0.76	-0.80	-0.79	-0.79	-0.81	-0.84	-0.85	-0.84	-0.82
Spillovers: Real GDP level											
Belgium	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 10. Ireland, temporary government consumption shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.22	-0.05	-0.01	0.01	0.02	0.03	0.02	0.02	0.01	0.00	0.00
Real consumption	-0.02	-0.02	0.01	0.03	0.03	0.04	0.05	0.05	0.05	0.05	0.05
Real investment	-0.24	0.07	0.09	0.07	0.05	0.03	0.02	0.00	-0.01	-0.02	-0.03
Real exports	-0.01	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Real imports	-0.85	0.06	0.04	0.02	0.01	0.00	0.00	0.01	0.01	0.01	0.02
Output gap (per cent of GDP)*	-0.18	-0.05	-0.03	0.00	0.02	0.02	0.02	0.01	0.01	0.00	0.00
Current account (per cent of GDP)*	0.86	-0.04	0.00	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.00
Real effective exchange rate	-0.01	-0.05	-0.05	-0.03	-0.02	-0.02	-0.01	0.01	0.01	0.02	0.02
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.02	-0.04	0.00	0.02	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Consumer expenditure deflator	-0.02	-0.05	-0.05	-0.04	-0.02	-0.02	-0.01	0.00	0.01	0.02	0.02
GDP deflator	0.00	-0.03	-0.03	-0.01	0.00	0.00	0.01	0.02	0.03	0.03	0.03
Policy interest rate*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP*	-0.91	0.00	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government debt (per cent of GDP)*	-0.34	-0.78	-0.79	-0.80	-0.78	-0.76	-0.75	-0.73	-0.71	-0.68	-0.66
Spillovers: Real GDP level											
Belgium	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 11. Italy, temporary government consumption shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.55	-0.11	0.04	0.07	0.04	0.01	0.00	0.00	0.00	0.01	0.01
Real consumption	-0.04	-0.07	-0.05	-0.02	-0.01	-0.01	0.00	0.02	0.03	0.03	0.04
Real investment	-0.71	0.52	0.30	0.09	-0.01	-0.03	-0.02	0.00	0.00	0.00	0.00
Real exports	-0.10	0.07	0.09	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Real imports	-2.20	0.61	0.05	-0.16	-0.16	-0.08	-0.01	0.02	0.04	0.04	0.05
Output gap (per cent of GDP)*	-0.43	-0.08	-0.02	0.02	0.04	0.03	0.01	0.00	0.00	0.00	0.01
Current account (per cent of GDP)*	0.62	-0.15	0.03	0.08	0.06	0.03	0.01	0.00	0.00	0.00	0.00
Real effective exchange rate	-0.10	-0.37	-0.35	-0.17	-0.03	0.02	0.03	0.02	0.02	0.02	0.02
Nominal effective exchange rate	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	-0.02	-0.07	-0.05	-0.02	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	-0.01	-0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.11	-0.30	0.02	0.19	0.15	0.05	0.00	-0.01	0.00	0.00	0.00
Consumer expenditure deflator	-0.10	-0.39	-0.37	-0.19	-0.04	0.01	0.01	0.01	0.01	0.01	0.01
GDP deflator	-0.09	-0.38	-0.35	-0.17	-0.03	0.02	0.03	0.02	0.02	0.02	0.03
Policy interest rate*	0.00	-0.04	-0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP*	-0.84	0.06	-0.05	-0.02	0.00	0.00	-0.01	-0.01	0.00	0.00	0.00
Government debt (per cent of GDP)*	0.46	-0.02	-0.30	-0.62	-0.76	-0.76	-0.73	-0.71	-0.70	-0.69	-0.68
Spillovers: Real GDP level											
Belgium	-0.08	0.04	0.02	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
Finland	-0.04	0.04	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
France	-0.04	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	-0.04	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	-0.07	0.02	0.02	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00
Ireland	-0.01	-0.01	0.00	-0.01	-0.01	0.00	0.00	0.01	0.01	0.01	0.01
Netherlands	-0.09	0.05	0.03	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01
Austria	-0.05	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	-0.05	0.03	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.00
Spain	-0.03	-0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.13	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 12. Netherlands, temporary government consumption shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.55	0.03	0.05	0.05	0.03	0.02	0.02	0.02	0.01	0.01	0.01
Real consumption	-0.06	-0.08	0.01	0.07	0.08	0.07	0.07	0.08	0.09	0.09	0.09
Real investment	-0.84	0.52	0.29	0.14	0.06	0.02	0.00	-0.01	-0.01	-0.02	-0.02
Real exports	-0.05	0.02	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
Real imports	-0.91	0.05	0.04	0.03	0.02	0.01	0.01	0.02	0.02	0.02	0.02
Output gap (per cent of GDP)*	-0.43	0.02	-0.03	0.01	0.04	0.04	0.02	0.01	0.01	0.01	0.01
Current account (per cent of GDP)*	0.78	0.00	0.01	-0.01	-0.02	-0.01	-0.01	-0.01	-0.01	-0.02	-0.02
Real effective exchange rate	-0.04	-0.11	-0.06	-0.02	0.00	0.00	0.00	0.02	0.03	0.03	0.03
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.00	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.05	-0.07	0.05	0.05	0.02	0.00	0.00	0.01	0.01	0.01	0.00
Consumer expenditure deflator	-0.05	-0.12	-0.08	-0.03	-0.01	-0.01	0.00	0.01	0.02	0.03	0.03
GDP deflator	-0.03	-0.09	-0.04	0.01	0.02	0.02	0.03	0.04	0.05	0.05	0.05
Policy interest rate*	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP*	-0.89	-0.01	-0.04	0.01	0.02	0.00	-0.01	-0.01	0.00	0.00	0.00
Government debt (per cent of GDP)*	-0.16	-0.81	-0.87	-0.89	-0.85	-0.82	-0.82	-0.82	-0.81	-0.79	-0.78
Spillovers: Real GDP level											
Belgium	-0.05	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	-0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	-0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00
Italy	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	-0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	-0.01	-0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.05	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 13. Austria, temporary government consumption shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.49	-0.03	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Real consumption	-0.05	-0.05	-0.02	-0.02	-0.02	0.00	0.01	0.02	0.02	0.03	0.04
Real investment	-0.71	0.49	0.18	0.06	0.02	0.01	0.00	0.00	-0.01	-0.01	-0.01
Real exports	-0.03	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Real imports	-1.35	0.18	0.06	0.01	-0.01	-0.01	0.00	0.00	0.01	0.01	0.02
Output gap (per cent of GDP)*	-0.39	-0.03	-0.04	0.01	0.02	0.00	0.00	0.01	0.01	0.01	0.01
Current account (per cent of GDP)*	0.74	-0.06	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00
Real effective exchange rate	-0.04	-0.12	-0.06	-0.01	-0.02	-0.02	-0.01	0.00	0.00	0.01	0.01
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.04	-0.09	0.06	0.05	-0.01	0.00	0.02	0.01	0.00	0.00	0.00
Consumer expenditure deflator	-0.04	-0.13	-0.07	-0.02	-0.03	-0.02	-0.01	0.00	0.00	0.00	0.01
GDP deflator	-0.03	-0.11	-0.05	-0.01	-0.01	-0.01	0.00	0.01	0.01	0.01	0.02
Policy interest rate*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP*	-0.90	-0.01	-0.02	0.02	0.00	-0.02	0.00	0.00	0.00	0.00	0.00
Government debt (per cent of GDP)*	-0.13	-0.73	-0.79	-0.78	-0.73	-0.73	-0.73	-0.72	-0.70	-0.69	-0.68
Spillovers: Real GDP level											
Belgium	-0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	-0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 14. Portugal, temporary government consumption shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.61	-0.02	0.00	0.01	0.00	0.00	-0.01	-0.01	0.00	0.00	0.01
Real consumption	-0.02	-0.08	-0.10	-0.08	-0.08	-0.08	-0.08	-0.06	-0.04	-0.02	0.00
Real investment	-0.87	0.46	0.25	0.13	0.06	0.03	0.02	0.01	0.01	0.02	0.02
Real exports	-0.01	0.01	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Real imports	-1.14	0.11	-0.01	-0.05	-0.06	-0.07	-0.06	-0.05	-0.03	-0.02	0.00
Output gap (per cent of GDP)*	-0.47	0.02	-0.05	-0.05	-0.01	0.00	0.00	-0.01	-0.01	-0.01	0.00
Current account (per cent of GDP)*	0.50	-0.04	0.02	0.03	0.04	0.04	0.04	0.04	0.03	0.03	0.02
Real effective exchange rate	-0.02	-0.08	-0.08	-0.07	-0.06	-0.05	-0.04	-0.03	-0.02	-0.02	-0.01
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.02	-0.06	-0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Consumer expenditure deflator	-0.02	-0.08	-0.09	-0.07	-0.06	-0.05	-0.04	-0.03	-0.02	-0.02	-0.01
GDP deflator	-0.01	-0.07	-0.08	-0.06	-0.04	-0.03	-0.02	-0.01	-0.01	0.00	0.00
Policy interest rate*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP*	-0.83	0.03	-0.03	0.00	0.01	0.00	-0.01	-0.01	-0.01	-0.01	-0.01
Government debt (per cent of GDP)*	0.31	-0.63	-0.64	-0.66	-0.64	-0.62	-0.61	-0.61	-0.61	-0.62	-0.63
Spillovers: Real GDP level											
Belgium	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 15. Spain, temporary government consumption shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.81	0.07	0.18	0.13	0.05	0.00	-0.01	-0.01	0.00	0.01	0.02
Real consumption	-0.08	-0.09	-0.01	0.02	0.03	0.04	0.06	0.08	0.09	0.10	0.11
Real investment	-1.46	1.03	0.65	0.19	-0.06	-0.10	-0.07	-0.02	0.00	0.01	0.00
Real exports	-0.04	0.10	0.18	0.04	-0.08	-0.10	-0.06	-0.03	-0.01	0.00	0.00
Real imports	-1.71	0.33	0.01	-0.18	-0.19	-0.09	0.03	0.11	0.14	0.14	0.13
Output gap (per cent of GDP)*	-0.64	0.07	0.02	0.02	0.04	0.04	0.02	0.00	0.00	0.00	0.01
Current account (per cent of GDP)*	0.57	-0.09	0.05	0.10	0.06	0.02	-0.01	-0.03	-0.03	-0.03	-0.03
Real effective exchange rate	-0.11	-0.40	-0.34	-0.15	0.00	0.08	0.10	0.09	0.08	0.07	0.07
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	-0.01	-0.05	-0.03	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	-0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.12	-0.31	0.06	0.20	0.16	0.08	0.02	-0.01	-0.01	-0.01	0.00
Consumer expenditure deflator	-0.12	-0.42	-0.36	-0.17	-0.01	0.06	0.09	0.08	0.07	0.06	0.06
GDP deflator	-0.10	-0.42	-0.33	-0.11	0.05	0.11	0.13	0.12	0.10	0.10	0.10
Policy interest rate*	0.00	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP*	-0.81	0.02	-0.05	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government debt (per cent of GDP)*	0.58	-0.34	-0.58	-0.77	-0.82	-0.80	-0.77	-0.75	-0.75	-0.74	-0.74
Spillovers: Real GDP level											
Belgium	-0.05	0.02	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
Finland	-0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	-0.03	0.01	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
Germany	-0.02	0.01	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
Greece	-0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	-0.01	-0.01	-0.01	-0.01	-0.01	0.00	0.00	0.01	0.01	0.01	0.01
Italy	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.05	0.02	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00
Austria	-0.02	0.00	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	-0.12	0.02	0.00	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.12	0.02	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Government investment shock

Table 16. Belgium, temporary government investment shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.46	0.02	0.00	-0.01	-0.01	-0.02	-0.03	-0.03	-0.04	-0.05	-0.06
Real consumption	-0.05	-0.04	-0.01	0.00	0.01	0.02	0.03	0.04	0.05	0.05	0.05
Real investment	-0.66	0.42	0.02	-0.09	-0.12	-0.12	-0.12	-0.12	-0.11	-0.10	-0.10
Real exports	-0.04	0.01	0.01	0.01	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01
Real imports	-0.82	0.06	0.00	-0.02	-0.02	-0.01	0.00	0.01	0.02	0.03	0.03
Output gap (per cent of GDP)*	-0.27	0.15	0.05	0.04	0.06	0.05	0.05	0.04	0.04	0.03	0.02
Current account (per cent of GDP)*	0.70	-0.04	0.01	0.02	0.02	0.01	0.00	-0.01	-0.02	-0.02	-0.03
Real effective exchange rate	-0.01	-0.03	-0.02	0.00	0.03	0.05	0.07	0.09	0.10	0.11	0.12
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.02	-0.03	0.01	0.02	0.03	0.03	0.02	0.02	0.01	0.01	0.01
Consumer expenditure deflator	-0.02	-0.04	-0.03	-0.01	0.02	0.05	0.07	0.09	0.10	0.11	0.12
GDP deflator	0.01	-0.01	0.01	0.03	0.06	0.09	0.11	0.13	0.14	0.15	0.16
Policy interest rate*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP*	-0.85	-0.01	-0.04	-0.02	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00
Government debt (per cent of GDP)*	-0.05	-0.81	-0.82	-0.83	-0.84	-0.84	-0.83	-0.82	-0.81	-0.79	-0.77
Spillovers: Real GDP level											
Finland	-0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.05	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 17. Finland, temporary government investment shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.64	-0.07	-0.04	-0.04	-0.06	-0.08	-0.08	-0.09	-0.09	-0.09	-0.09
Real consumption	-0.07	-0.11	-0.10	-0.11	-0.13	-0.13	-0.13	-0.12	-0.11	-0.11	-0.11
Real investment	-0.97	0.21	0.04	-0.09	-0.16	-0.18	-0.19	-0.19	-0.18	-0.16	-0.14
Real exports	-0.02	0.02	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Real imports	-1.40	0.11	-0.05	-0.13	-0.15	-0.13	-0.11	-0.08	-0.07	-0.05	-0.04
Output gap (per cent of GDP)*	-0.45	0.08	0.04	0.05	0.08	0.07	0.05	0.03	0.02	0.03	0.02
Current account (per cent of GDP)*	0.63	-0.05	0.02	0.03	0.03	0.03	0.02	0.02	0.01	0.00	0.00
Real effective exchange rate	-0.05	-0.15	-0.13	-0.07	-0.01	0.03	0.05	0.07	0.08	0.09	0.09
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.05	-0.11	0.02	0.07	0.06	0.04	0.02	0.02	0.02	0.01	0.00
Consumer expenditure deflator	-0.05	-0.16	-0.14	-0.07	-0.01	0.02	0.05	0.06	0.08	0.09	0.09
GDP deflator	-0.04	-0.14	-0.12	-0.05	0.01	0.04	0.06	0.08	0.10	0.11	0.11
Policy interest rate*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP*	-0.88	0.03	-0.05	-0.01	0.00	-0.01	-0.01	-0.01	0.00	0.00	0.00
Government debt (per cent of GDP)*	-0.13	-0.68	-0.73	-0.76	-0.75	-0.73	-0.72	-0.71	-0.69	-0.66	-0.64
Spillovers: Real GDP level											
Belgium	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 18. France, temporary government investment shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.59	-0.03	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.02	-0.02	-0.02
Real consumption	-0.12	-0.11	-0.03	0.00	0.01	0.02	0.03	0.05	0.06	0.07	0.08
Real investment	-0.67	0.36	0.15	0.02	-0.04	-0.06	-0.07	-0.07	-0.08	-0.08	-0.08
Real exports	-0.17	0.13	0.12	0.08	0.04	0.01	-0.01	-0.02	-0.04	-0.05	-0.05
Real imports	-1.97	0.18	0.13	0.06	0.01	-0.01	-0.01	0.00	0.01	0.02	0.03
Output gap (per cent of GDP)*	-0.35	0.13	0.04	0.03	0.04	0.05	0.05	0.04	0.04	0.03	0.02
Current account (per cent of GDP)*	0.57	-0.04	-0.02	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
Real effective exchange rate	-0.04	-0.13	-0.13	-0.09	-0.05	-0.01	0.03	0.06	0.08	0.10	0.12
Nominal effective exchange rate	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
EA wide real effective exchange rate	-0.01	-0.05	-0.04	-0.03	-0.02	-0.01	0.00	0.01	0.01	0.02	0.02
EA wide nominal effective exchange rate	0.00	-0.02	-0.01	-0.01	-0.01	0.00	0.00	0.01	0.01	0.01	0.01
Headline CPI Inflation*	-0.06	-0.11	0.01	0.04	0.05	0.04	0.04	0.03	0.03	0.02	0.01
Consumer expenditure deflator	-0.06	-0.17	-0.16	-0.12	-0.07	-0.03	0.01	0.04	0.07	0.09	0.10
GDP deflator	-0.06	-0.19	-0.18	-0.13	-0.07	-0.02	0.03	0.07	0.10	0.13	0.15
Policy interest rate*	0.00	-0.03	-0.02	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP*	-0.81	0.01	-0.06	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government debt (per cent of GDP)*	0.13	-0.56	-0.63	-0.69	-0.73	-0.75	-0.78	-0.79	-0.80	-0.80	-0.80
Spillovers: Real GDP level											
Belgium	-0.17	0.03	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.01
Finland	-0.06	0.04	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Germany	-0.06	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	-0.08	0.02	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	-0.02	-0.02	-0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Italy	-0.04	-0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.14	0.04	0.05	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00
Austria	-0.05	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	-0.11	0.02	0.02	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00
Spain	-0.05	-0.04	0.02	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.18	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01

Notes: see table 5.

Table 19. Germany, temporary government investment shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.48	-0.02	-0.02	-0.03	-0.04	-0.05	-0.06	-0.07	-0.07	-0.08	-0.09
Real consumption	-0.14	-0.06	-0.06	-0.06	-0.05	-0.04	-0.03	-0.02	-0.01	0.00	0.00
Real investment	-0.63	0.32	0.01	-0.10	-0.14	-0.15	-0.16	-0.16	-0.15	-0.14	-0.13
Real exports	-0.28	0.16	0.12	0.06	0.01	-0.02	-0.05	-0.07	-0.08	-0.08	-0.09
Real imports	-1.96	0.27	0.09	0.00	-0.05	-0.07	-0.07	-0.06	-0.05	-0.03	-0.01
Output gap (per cent of GDP)*	-0.33	0.10	0.08	0.09	0.08	0.06	0.05	0.04	0.03	0.02	0.01
Current account (per cent of GDP)*	0.72	-0.05	0.00	0.02	0.03	0.03	0.03	0.03	0.02	0.01	0.01
Real effective exchange rate	-0.06	-0.16	-0.10	-0.05	0.01	0.07	0.11	0.14	0.16	0.16	0.16
Nominal effective exchange rate	0.01	-0.01	-0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00
EA wide real effective exchange rate	-0.01	-0.06	-0.05	-0.03	-0.01	0.01	0.02	0.03	0.04	0.04	0.04
EA wide nominal effective exchange rate	0.02	-0.01	-0.02	-0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01
Headline CPI Inflation*	-0.10	-0.13	0.06	0.06	0.07	0.06	0.05	0.04	0.02	0.01	0.00
Consumer expenditure deflator	-0.10	-0.22	-0.16	-0.10	-0.04	0.02	0.07	0.10	0.13	0.14	0.15
GDP deflator	-0.11	-0.26	-0.17	-0.10	-0.01	0.06	0.12	0.17	0.19	0.21	0.21
Policy interest rate*	0.00	-0.04	-0.03	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP*	-0.89	0.00	-0.02	-0.02	-0.02	-0.01	0.00	0.00	0.00	0.00	0.00
Government debt (per cent of GDP)*	-0.01	-0.61	-0.67	-0.73	-0.79	-0.83	-0.85	-0.85	-0.85	-0.83	-0.81
Spillovers: Real GDP level											
Belgium	-0.22	0.04	0.03	0.01	0.00	-0.01	-0.01	-0.01	0.00	0.00	0.01
Finland	-0.12	0.06	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00
France	-0.09	0.02	0.01	0.00	-0.01	-0.01	-0.01	-0.01	0.00	0.00	0.01
Greece	-0.14	0.02	0.04	0.02	0.01	0.00	0.00	0.00	0.00	0.01	0.01
Ireland	-0.04	-0.05	-0.03	-0.02	0.00	0.01	0.02	0.02	0.03	0.03	0.03
Italy	-0.06	-0.02	0.01	0.02	0.01	0.00	0.00	-0.01	-0.01	-0.01	-0.01
Netherlands	-0.29	0.05	0.06	0.04	0.01	0.00	-0.01	-0.01	0.00	0.00	0.00
Austria	-0.15	-0.06	-0.03	-0.02	-0.02	-0.01	0.00	0.00	0.01	0.02	0.02
Portugal	-0.13	0.04	0.03	0.02	0.02	0.01	0.01	0.00	0.00	-0.01	-0.01
Spain	-0.06	-0.03	0.02	0.04	0.02	0.01	0.00	-0.01	-0.01	-0.01	-0.01
Euro Area	-0.22	0.00	0.01	0.00	-0.01	-0.01	-0.02	-0.02	-0.02	-0.02	-0.02

Notes: see table 5.

Table 20. Greece, temporary government investment shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.96	0.15	0.12	0.08	0.03	0.00	-0.02	-0.03	-0.04	-0.06	-0.07
Real consumption	-0.22	0.03	0.10	0.09	0.04	0.02	0.02	0.03	0.03	0.03	0.02
Real investment	-5.36	2.77	0.75	0.08	-0.16	-0.22	-0.21	-0.19	-0.18	-0.17	-0.15
Real exports	-0.02	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	-0.01
Real imports	-1.91	0.50	0.18	0.00	-0.10	-0.12	-0.08	-0.03	0.01	0.04	0.06
Output gap (per cent of GDP)*	-0.71	0.18	0.05	0.06	0.11	0.11	0.07	0.04	0.02	0.01	0.01
Current account (per cent of GDP)*	0.66	-0.18	-0.06	0.01	0.04	0.05	0.04	0.02	0.01	0.00	-0.01
Real effective exchange rate	-0.06	-0.18	-0.17	-0.11	-0.04	0.01	0.05	0.09	0.12	0.14	0.15
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.06	-0.13	0.02	0.06	0.06	0.05	0.04	0.04	0.03	0.02	0.01
Consumer expenditure deflator	-0.06	-0.19	-0.17	-0.11	-0.04	0.01	0.05	0.08	0.12	0.14	0.15
GDP deflator	-0.02	-0.14	-0.12	-0.06	0.01	0.06	0.10	0.14	0.17	0.19	0.21
Policy interest rate*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP*	-0.81	-0.02	-0.06	-0.01	0.02	0.01	0.00	-0.01	0.00	0.00	0.00
Government debt (per cent of GDP)*	1.34	-0.83	-0.84	-0.88	-0.88	-0.89	-0.91	-0.94	-0.94	-0.93	-0.90
Spillovers: Real GDP level											
Belgium	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 21. Ireland, temporary government investment shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.22	-0.08	-0.06	-0.06	-0.08	-0.10	-0.12	-0.13	-0.14	-0.15	-0.16
Real consumption	-0.05	-0.10	-0.13	-0.16	-0.18	-0.21	-0.22	-0.24	-0.25	-0.26	-0.26
Real investment	-0.34	-0.13	-0.16	-0.19	-0.23	-0.25	-0.25	-0.24	-0.23	-0.21	-0.18
Real exports	-0.01	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Real imports	-0.87	0.00	-0.04	-0.06	-0.07	-0.07	-0.06	-0.05	-0.05	-0.04	-0.04
Output gap (per cent of GDP)*	-0.08	0.10	0.09	0.10	0.09	0.07	0.04	0.02	0.01	0.00	-0.01
Current account (per cent of GDP)*	0.88	0.00	0.04	0.05	0.05	0.05	0.04	0.03	0.03	0.02	0.02
Real effective exchange rate	-0.01	-0.02	0.00	0.04	0.06	0.07	0.08	0.09	0.08	0.08	0.07
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.01	-0.02	0.03	0.04	0.02	0.01	0.01	0.01	0.00	-0.01	-0.01
Consumer expenditure deflator	-0.01	-0.03	0.00	0.03	0.06	0.07	0.08	0.09	0.09	0.08	0.07
GDP deflator	0.00	-0.01	0.01	0.04	0.06	0.07	0.08	0.08	0.08	0.08	0.07
Policy interest rate*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP*	-0.95	0.00	-0.02	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government debt (per cent of GDP)*	-0.36	-0.82	-0.83	-0.82	-0.79	-0.76	-0.72	-0.69	-0.66	-0.63	-0.61
Spillovers: Real GDP level											
Belgium	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 22. Italy, temporary government investment shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.56	-0.15	-0.03	-0.02	-0.05	-0.09	-0.10	-0.09	-0.09	-0.08	-0.07
Real consumption	-0.04	-0.09	-0.09	-0.08	-0.08	-0.08	-0.07	-0.06	-0.05	-0.04	-0.03
Real investment	-0.87	0.28	0.07	-0.10	-0.17	-0.17	-0.14	-0.12	-0.11	-0.10	-0.10
Real exports	-0.10	0.06	0.07	0.03	-0.01	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01
Real imports	-2.25	0.52	-0.02	-0.19	-0.15	-0.06	0.01	0.04	0.04	0.04	0.04
Output gap (per cent of GDP)*	-0.36	0.02	0.06	0.07	0.07	0.06	0.04	0.03	0.02	0.03	0.03
Current account (per cent of GDP)*	0.64	-0.12	0.04	0.08	0.06	0.03	0.01	0.00	0.00	0.00	0.00
Real effective exchange rate	-0.08	-0.31	-0.24	-0.05	0.09	0.13	0.12	0.10	0.10	0.09	0.09
Nominal effective exchange rate	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	-0.02	-0.05	-0.03	-0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01
EA wide nominal effective exchange rate	0.00	-0.01	0.01	0.01	0.00	-0.01	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.10	-0.25	0.07	0.21	0.14	0.04	-0.01	-0.01	-0.01	0.00	0.00
Consumer expenditure deflator	-0.10	-0.34	-0.27	-0.07	0.07	0.12	0.11	0.09	0.09	0.09	0.09
GDP deflator	-0.08	-0.32	-0.25	-0.05	0.09	0.13	0.12	0.11	0.10	0.10	0.10
Policy interest rate*	0.00	-0.03	-0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP*	-0.88	0.05	-0.07	-0.04	-0.01	0.00	-0.01	0.00	0.00	0.00	0.00
Government debt (per cent of GDP)*	0.44	-0.10	-0.41	-0.74	-0.86	-0.85	-0.80	-0.77	-0.76	-0.75	-0.74
Spillovers: Real GDP level											
Belgium	-0.08	0.04	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00
Finland	-0.05	0.03	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00
France	-0.04	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	-0.04	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
Greece	-0.08	0.02	0.02	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Ireland	-0.02	-0.01	-0.01	-0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01
Netherlands	-0.09	0.04	0.03	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
Austria	-0.05	0.00	0.00	-0.01	-0.01	0.00	0.00	0.00	0.01	0.01	0.00
Portugal	-0.05	0.03	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.00
Spain	-0.03	-0.01	0.02	0.01	0.01	0.00	0.01	0.01	0.00	0.00	0.00
Euro Area	-0.13	-0.01	0.00	0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01

Notes: see table 5.

Table 23. Netherlands, temporary government investment shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.56	0.00	0.00	-0.01	-0.03	-0.05	-0.05	-0.06	-0.06	-0.07	-0.07
Real consumption	-0.07	-0.13	-0.07	-0.05	-0.06	-0.09	-0.10	-0.10	-0.11	-0.11	-0.12
Real investment	-0.93	0.35	0.08	-0.06	-0.13	-0.16	-0.15	-0.15	-0.14	-0.13	-0.12
Real exports	-0.05	0.02	0.02	0.01	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01
Real imports	-0.92	0.01	-0.02	-0.04	-0.05	-0.06	-0.06	-0.05	-0.04	-0.04	-0.04
Output gap (per cent of GDP)*	-0.36	0.11	0.05	0.07	0.09	0.08	0.05	0.04	0.03	0.03	0.03
Current account (per cent of GDP)*	0.77	-0.01	0.01	-0.01	-0.02	-0.02	-0.02	-0.02	-0.03	-0.04	-0.04
Real effective exchange rate	-0.04	-0.09	-0.03	0.02	0.04	0.05	0.05	0.07	0.08	0.08	0.08
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.05	-0.06	0.06	0.06	0.03	0.01	0.01	0.01	0.01	0.00	0.00
Consumer expenditure deflator	-0.04	-0.10	-0.05	0.01	0.04	0.04	0.05	0.06	0.07	0.08	0.08
GDP deflator	-0.02	-0.07	-0.01	0.04	0.06	0.07	0.07	0.09	0.09	0.10	0.10
Policy interest rate*	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP*	-0.89	0.00	-0.04	0.01	0.02	0.00	-0.01	0.00	0.00	0.00	0.00
Government debt (per cent of GDP)*	-0.16	-0.80	-0.85	-0.87	-0.83	-0.80	-0.79	-0.79	-0.78	-0.76	-0.74
Spillovers: Real GDP level											
Belgium	-0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	-0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	-0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00
Italy	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	-0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	-0.01	-0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 24. Austria, temporary government investment shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.50	-0.05	-0.04	-0.04	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Real consumption	-0.07	-0.09	-0.07	-0.08	-0.08	-0.07	-0.06	-0.05	-0.05	-0.04	-0.03
Real investment	-0.85	0.30	0.00	-0.10	-0.13	-0.13	-0.12	-0.12	-0.12	-0.11	-0.10
Real exports	-0.03	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Real imports	-1.39	0.11	-0.01	-0.06	-0.06	-0.05	-0.04	-0.03	-0.02	-0.01	0.00
Output gap (per cent of GDP)*	-0.33	0.05	0.03	0.06	0.07	0.04	0.04	0.04	0.03	0.03	0.03
Current account (per cent of GDP)*	0.75	-0.05	0.01	0.02	0.02	0.02	0.02	0.01	0.00	0.00	0.00
Real effective exchange rate	-0.04	-0.11	-0.04	0.02	0.01	0.01	0.03	0.04	0.04	0.04	0.04
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.04	-0.08	0.07	0.06	0.00	0.00	0.02	0.01	0.00	0.00	0.00
Consumer expenditure deflator	-0.04	-0.12	-0.05	0.01	0.01	0.01	0.03	0.03	0.04	0.04	0.04
GDP deflator	-0.03	-0.10	-0.04	0.02	0.02	0.02	0.04	0.04	0.05	0.05	0.05
Policy interest rate*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP*	-0.88	0.00	-0.03	0.01	-0.01	-0.02	0.00	0.00	0.00	0.00	0.00
Government debt (per cent of GDP)*	-0.11	-0.70	-0.77	-0.77	-0.74	-0.73	-0.73	-0.72	-0.70	-0.69	-0.68
Spillovers: Real GDP level											
Belgium	-0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	-0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 25. Portugal, temporary government investment shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.62	-0.05	-0.05	-0.05	-0.06	-0.07	-0.07	-0.07	-0.06	-0.05	-0.04
Real consumption	-0.02	-0.10	-0.13	-0.13	-0.13	-0.14	-0.14	-0.12	-0.09	-0.06	-0.03
Real investment	-0.97	0.27	0.04	-0.07	-0.12	-0.13	-0.12	-0.11	-0.10	-0.08	-0.07
Real exports	-0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	-0.01	0.00
Real imports	-1.16	0.06	-0.07	-0.11	-0.12	-0.12	-0.11	-0.09	-0.07	-0.04	-0.02
Output gap (per cent of GDP)*	-0.40	0.11	0.02	0.01	0.04	0.06	0.05	0.04	0.03	0.04	0.05
Current account (per cent of GDP)*	0.50	-0.03	0.03	0.05	0.05	0.05	0.04	0.04	0.03	0.02	0.01
Real effective exchange rate	-0.02	-0.07	-0.06	-0.03	-0.01	0.00	0.01	0.02	0.03	0.03	0.04
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.02	-0.05	0.01	0.03	0.02	0.02	0.01	0.01	0.01	0.01	0.01
Consumer expenditure deflator	-0.02	-0.07	-0.06	-0.04	-0.01	0.00	0.01	0.02	0.03	0.03	0.04
GDP deflator	-0.01	-0.06	-0.05	-0.02	0.00	0.02	0.03	0.04	0.04	0.05	0.05
Policy interest rate*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP*	-0.89	0.03	-0.04	-0.01	0.01	0.00	-0.01	-0.02	-0.02	-0.01	-0.01
Government debt (per cent of GDP)*	0.28	-0.68	-0.70	-0.72	-0.71	-0.69	-0.68	-0.69	-0.70	-0.71	-0.73
Spillovers: Real GDP level											
Belgium	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 26. Spain, temporary government investment shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.82	0.03	0.11	0.04	-0.04	-0.08	-0.09	-0.07	-0.06	-0.04	-0.04
Real consumption	-0.09	-0.11	-0.06	-0.03	-0.03	-0.02	0.00	0.02	0.04	0.05	0.06
Real investment	-1.57	0.82	0.42	-0.01	-0.20	-0.21	-0.15	-0.10	-0.07	-0.05	-0.05
Real exports	-0.04	0.09	0.16	0.01	-0.10	-0.10	-0.06	-0.03	-0.01	-0.01	-0.01
Real imports	-1.75	0.26	-0.06	-0.22	-0.21	-0.09	0.03	0.10	0.13	0.13	0.12
Output gap (per cent of GDP)*	-0.59	0.14	0.07	0.04	0.06	0.05	0.03	0.02	0.01	0.02	0.02
Current account (per cent of GDP)*	0.57	-0.07	0.07	0.10	0.06	0.01	-0.02	-0.03	-0.03	-0.04	-0.04
Real effective exchange rate	-0.10	-0.37	-0.27	-0.07	0.08	0.14	0.15	0.14	0.12	0.12	0.11
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	-0.01	-0.04	-0.03	-0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01
EA wide nominal effective exchange rate	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.11	-0.28	0.10	0.21	0.15	0.07	0.01	-0.01	-0.01	-0.01	0.00
Consumer expenditure deflator	-0.11	-0.39	-0.29	-0.09	0.06	0.13	0.14	0.13	0.11	0.11	0.11
GDP deflator	-0.10	-0.38	-0.26	-0.02	0.13	0.18	0.18	0.16	0.15	0.14	0.14
Policy interest rate*	0.00	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP*	-0.81	0.02	-0.06	-0.02	0.00	0.00	0.00	-0.01	0.00	0.00	0.00
Government debt (per cent of GDP)*	0.59	-0.35	-0.60	-0.80	-0.84	-0.81	-0.78	-0.77	-0.76	-0.76	-0.76
Spillovers: Real GDP level											
Belgium	-0.05	0.02	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
Finland	-0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	-0.03	0.01	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
Germany	-0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	-0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	-0.01	-0.01	-0.01	-0.01	-0.01	0.00	0.00	0.01	0.01	0.01	0.01
Italy	-0.02	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.06	0.02	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00
Austria	-0.02	0.00	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	-0.13	0.02	0.00	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.12	0.01	0.01	0.00	-0.01	-0.01	-0.01	-0.01	0.00	0.00	0.00

Notes: see table 5.

Income tax shock

Table 27. Belgium, temporary income tax shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.10	-0.05	-0.04	-0.03	-0.02	-0.01	-0.01	0.00	0.00	0.00	0.00
Real consumption	-0.42	-0.25	-0.21	-0.18	-0.16	-0.13	-0.11	-0.09	-0.07	-0.06	-0.04
Real investment	-0.13	0.05	0.04	0.03	0.03	0.03	0.02	0.02	0.01	0.01	0.01
Real exports	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Real imports	-0.17	-0.08	-0.07	-0.06	-0.05	-0.05	-0.04	-0.03	-0.03	-0.02	-0.02
Output gap (per cent of GDP)*	-0.07	-0.02	-0.03	-0.03	-0.02	-0.02	-0.01	-0.01	-0.01	0.00	0.00
Current account (per cent of GDP)*	0.15	0.07	0.06	0.06	0.05	0.05	0.04	0.04	0.04	0.03	0.03
Real effective exchange rate	0.00	-0.01	-0.02	-0.02	-0.03	-0.03	-0.03	-0.03	-0.02	-0.02	-0.02
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	0.00	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer expenditure deflator	0.00	-0.01	-0.02	-0.03	-0.03	-0.03	-0.03	-0.03	-0.02	-0.02	-0.02
GDP deflator	0.00	-0.01	-0.01	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.01
Policy interest rate*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP)*	-0.93	0.02	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Government debt (per cent of GDP)*	-0.48	-0.82	-0.78	-0.75	-0.73	-0.72	-0.71	-0.70	-0.69	-0.69	-0.68
Spillovers: Real GDP level											
Finland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 28. Finland, temporary income tax shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.20	-0.12	-0.08	-0.06	-0.04	-0.03	-0.02	-0.01	0.00	0.00	0.00
Real consumption	-0.61	-0.34	-0.28	-0.23	-0.20	-0.17	-0.14	-0.11	-0.09	-0.06	-0.04
Real investment	-0.29	-0.01	0.05	0.06	0.07	0.06	0.05	0.04	0.03	0.03	0.02
Real exports	-0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Real imports	-0.46	-0.17	-0.15	-0.14	-0.14	-0.13	-0.12	-0.10	-0.09	-0.07	-0.05
Output gap (per cent of GDP)*	-0.17	-0.09	-0.08	-0.07	-0.04	-0.02	-0.01	-0.01	-0.01	0.00	0.00
Current account (per cent of GDP)*	0.20	0.09	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.04	0.04
Real effective exchange rate	-0.02	-0.07	-0.10	-0.11	-0.11	-0.11	-0.10	-0.09	-0.07	-0.06	-0.05
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.02	-0.05	-0.03	-0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Consumer expenditure deflator	-0.02	-0.07	-0.10	-0.11	-0.11	-0.11	-0.10	-0.09	-0.07	-0.06	-0.05
GDP deflator	-0.01	-0.06	-0.10	-0.11	-0.11	-0.11	-0.10	-0.09	-0.07	-0.06	-0.05
Policy interest rate*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP)*	-0.86	0.06	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Government debt (per cent of GDP)*	-0.41	-0.68	-0.63	-0.62	-0.61	-0.60	-0.59	-0.59	-0.59	-0.59	-0.58
Spillovers: Real GDP level											
Belgium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 29. France, temporary income tax shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.40	-0.07	-0.04	-0.02	-0.01	0.00	0.01	0.02	0.03	0.03	0.03
Real consumption	-1.40	-0.33	-0.24	-0.19	-0.15	-0.11	-0.08	-0.05	-0.02	0.00	0.02
Real investment	-0.41	0.30	0.22	0.15	0.11	0.09	0.07	0.06	0.04	0.03	0.02
Real exports	-0.11	0.09	0.11	0.10	0.08	0.07	0.06	0.05	0.04	0.03	0.02
Real imports	-1.36	-0.07	-0.02	-0.02	-0.03	-0.04	-0.04	-0.03	-0.03	-0.02	-0.01
Output gap (per cent of GDP)*	-0.29	-0.02	-0.06	-0.06	-0.04	-0.02	-0.01	0.00	0.01	0.01	0.01
Current account (per cent of GDP)*	0.39	0.04	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Real effective exchange rate	-0.04	-0.12	-0.15	-0.15	-0.14	-0.13	-0.11	-0.09	-0.06	-0.04	-0.02
Nominal effective exchange rate	-0.01	-0.02	-0.01	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	-0.02	-0.04	-0.05	-0.04	-0.04	-0.03	-0.02	-0.02	-0.01	-0.01	-0.01
EA wide nominal effective exchange rate	-0.01	-0.03	-0.03	-0.02	-0.02	-0.01	-0.01	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.04	-0.10	-0.03	0.00	0.01	0.02	0.02	0.02	0.02	0.02	0.02
Consumer expenditure deflator	-0.04	-0.13	-0.16	-0.16	-0.15	-0.13	-0.11	-0.09	-0.07	-0.05	-0.03
GDP deflator	-0.04	-0.15	-0.18	-0.18	-0.17	-0.15	-0.13	-0.10	-0.08	-0.05	-0.03
Policy interest rate*	0.00	-0.03	-0.02	-0.01	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP)*	-1.20	0.04	-0.02	-0.01	0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Government debt (per cent of GDP)*	-0.31	-0.91	-0.89	-0.88	-0.88	-0.89	-0.90	-0.91	-0.93	-0.94	-0.96
Spillovers: Real GDP level											
Belgium	-0.11	0.02	0.02	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00
Finland	-0.04	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01
Germany	-0.04	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Greece	-0.05	0.02	0.03	0.03	0.02	0.01	0.01	0.01	0.01	0.00	0.00
Ireland	-0.01	-0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Italy	-0.03	-0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Netherlands	-0.09	0.02	0.04	0.03	0.03	0.02	0.01	0.01	0.01	0.01	0.01
Austria	-0.03	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Portugal	-0.07	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01
Spain	-0.03	-0.02	0.02	0.03	0.02	0.02	0.01	0.01	0.00	0.00	0.00
Euro Area	-0.12	-0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Notes: see table 5.

Table 30. Germany, temporary income tax shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.31	0.00	0.02	0.02	0.03	0.03	0.03	0.03	0.02	0.02	0.01
Real consumption	-1.27	-0.07	-0.01	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.03
Real investment	-0.34	0.34	0.16	0.07	0.03	0.02	0.00	-0.01	-0.02	-0.02	-0.02
Real exports	-0.18	0.12	0.13	0.10	0.07	0.05	0.03	0.02	0.00	-0.01	-0.02
Real imports	-1.29	0.20	0.16	0.09	0.04	0.01	-0.01	-0.02	-0.03	-0.03	-0.02
Output gap (per cent of GDP)*	-0.27	-0.01	0.00	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01
Current account (per cent of GDP)*	0.47	-0.04	-0.03	-0.02	-0.01	0.00	0.01	0.01	0.01	0.01	0.01
Real effective exchange rate	-0.05	-0.14	-0.13	-0.12	-0.10	-0.07	-0.04	-0.01	0.01	0.03	0.04
Nominal effective exchange rate	0.00	-0.01	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	-0.01	-0.05	-0.05	-0.05	-0.04	-0.03	-0.01	-0.01	0.00	0.01	0.01
EA wide nominal effective exchange rate	0.00	-0.02	-0.02	-0.02	-0.01	-0.01	0.00	0.01	0.01	0.01	0.01
Headline CPI Inflation*	-0.07	-0.11	0.01	0.02	0.03	0.03	0.03	0.03	0.02	0.02	0.02
Consumer expenditure deflator	-0.07	-0.17	-0.16	-0.15	-0.12	-0.09	-0.06	-0.04	-0.01	0.01	0.02
GDP deflator	-0.07	-0.21	-0.19	-0.17	-0.14	-0.10	-0.06	-0.02	0.01	0.03	0.05
Policy interest rate*	0.00	-0.03	-0.02	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP)*	-0.78	0.00	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
Government debt (per cent of GDP)*	-0.12	-0.56	-0.57	-0.58	-0.60	-0.62	-0.63	-0.65	-0.66	-0.66	-0.66
Spillovers: Real GDP level											
Belgium	-0.14	0.04	0.04	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Finland	-0.08	0.05	0.03	0.03	0.02	0.01	0.01	0.01	0.00	0.00	0.00
France	-0.06	0.02	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Greece	-0.09	0.02	0.04	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00
Ireland	-0.02	-0.02	-0.01	0.00	0.01	0.01	0.01	0.02	0.02	0.02	0.01
Italy	-0.04	-0.01	0.01	0.02	0.02	0.01	0.01	0.00	0.00	0.00	0.00
Netherlands	-0.19	0.04	0.06	0.05	0.03	0.01	0.01	0.01	0.00	0.00	0.00
Austria	-0.09	-0.03	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
Portugal	-0.08	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.01
Spain	-0.04	-0.02	0.03	0.03	0.03	0.01	0.01	0.00	0.00	0.00	0.00
Euro Area	-0.14	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01

Notes: see table 5.

Table 31. Greece, temporary income tax shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.59	0.04	0.05	0.04	0.03	0.02	0.02	0.02	0.02	0.01	0.01
Real consumption	-1.06	-0.11	-0.05	-0.04	-0.05	-0.05	-0.03	-0.01	0.01	0.02	0.03
Real investment	-3.22	1.64	0.60	0.22	0.08	0.03	0.01	0.00	-0.01	-0.02	-0.03
Real exports	-0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
Real imports	-1.18	0.20	0.06	-0.04	-0.09	-0.11	-0.09	-0.06	-0.04	-0.02	0.00
Output gap (per cent of GDP)*	-0.46	0.03	-0.03	-0.01	0.03	0.04	0.03	0.01	0.01	0.01	0.01
Current account (per cent of GDP)*	0.41	-0.07	-0.02	0.02	0.04	0.05	0.04	0.03	0.03	0.02	0.02
Real effective exchange rate	-0.04	-0.12	-0.13	-0.12	-0.09	-0.07	-0.05	-0.03	-0.01	0.01	0.03
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.04	-0.09	-0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Consumer expenditure deflator	-0.04	-0.13	-0.14	-0.12	-0.09	-0.07	-0.05	-0.03	-0.01	0.01	0.03
GDP deflator	-0.01	-0.09	-0.11	-0.09	-0.06	-0.04	-0.02	0.00	0.02	0.04	0.06
Policy interest rate*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP)*	-0.72	0.01	-0.03	0.00	0.01	0.00	-0.01	-0.01	0.00	0.00	0.00
Government debt (per cent of GDP)*	0.68	-0.60	-0.59	-0.61	-0.61	-0.62	-0.65	-0.67	-0.69	-0.70	-0.70
Spillovers: Real GDP level											
Belgium	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 32. Ireland, temporary income tax shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.06	-0.06	-0.04	-0.03	-0.01	0.00	0.01	0.02	0.02	0.02	0.02
Real consumption	-0.61	-0.48	-0.33	-0.23	-0.15	-0.09	-0.05	-0.02	0.00	0.01	0.02
Real investment	-0.07	-0.03	0.01	0.03	0.04	0.04	0.03	0.02	0.01	0.00	0.00
Real exports	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00
Real imports	-0.23	-0.16	-0.10	-0.06	-0.04	-0.03	-0.02	-0.02	-0.01	-0.01	0.00
Output gap (per cent of GDP)*	-0.05	-0.05	-0.04	-0.03	-0.01	0.00	0.01	0.01	0.01	0.01	0.01
Current account (per cent of GDP)*	0.24	0.18	0.12	0.09	0.07	0.06	0.05	0.05	0.04	0.04	0.03
Real effective exchange rate	0.00	-0.02	-0.03	-0.03	-0.03	-0.03	-0.02	-0.02	-0.01	-0.01	0.00
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
Consumer expenditure deflator	0.00	-0.02	-0.03	-0.03	-0.03	-0.03	-0.03	-0.02	-0.01	-0.01	0.00
GDP deflator	0.00	-0.01	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.01	0.00	0.00
Policy interest rate*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP)*	-0.99	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government debt (per cent of GDP)*	-0.55	-0.87	-0.83	-0.81	-0.79	-0.78	-0.77	-0.75	-0.74	-0.73	-0.71
Spillovers: Real GDP level											
Belgium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 33. Italy, temporary income tax shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.11	-0.13	-0.08	-0.04	-0.02	-0.01	0.00	0.00	0.00	0.00	0.01
Real consumption	-0.39	-0.36	-0.27	-0.20	-0.15	-0.11	-0.08	-0.05	-0.03	-0.01	0.01
Real investment	-0.15	0.02	0.10	0.09	0.05	0.03	0.02	0.01	0.01	0.01	0.00
Real exports	-0.02	0.01	0.03	0.03	0.02	0.01	0.01	0.01	0.00	0.00	0.00
Real imports	-0.51	-0.27	-0.16	-0.15	-0.15	-0.13	-0.10	-0.07	-0.04	-0.02	0.00
Output gap (per cent of GDP)*	-0.09	-0.10	-0.07	-0.05	-0.03	-0.01	0.00	0.00	0.00	0.00	0.00
Current account (per cent of GDP)*	0.15	0.09	0.07	0.07	0.07	0.06	0.05	0.03	0.03	0.02	0.01
Real effective exchange rate	-0.02	-0.10	-0.16	-0.16	-0.13	-0.09	-0.06	-0.04	-0.03	-0.01	-0.01
Nominal effective exchange rate	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	-0.01	-0.03	-0.03	-0.02	-0.02	-0.01	-0.01	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	-0.01	-0.02	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.01	-0.08	-0.07	0.00	0.03	0.04	0.03	0.02	0.01	0.01	0.01
Consumer expenditure deflator	-0.01	-0.09	-0.16	-0.16	-0.13	-0.09	-0.06	-0.04	-0.03	-0.02	-0.01
GDP deflator	-0.01	-0.09	-0.15	-0.16	-0.12	-0.09	-0.06	-0.04	-0.03	-0.02	-0.01
Policy interest rate*	0.00	-0.02	-0.02	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP)*	-0.93	0.05	0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	0.00
Government debt (per cent of GDP)*	-0.39	-0.53	-0.47	-0.51	-0.58	-0.63	-0.66	-0.68	-0.69	-0.70	-0.71
Spillovers: Real GDP level											
Belgium	-0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	-0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
France	-0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	-0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	-0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.02	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Austria	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	-0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Spain	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.02	-0.02	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 34. Netherlands, temporary income tax shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.18	-0.12	-0.05	-0.01	0.00	0.01	0.01	0.02	0.02	0.02	0.02
Real consumption	-0.83	-0.65	-0.36	-0.20	-0.10	-0.05	-0.01	0.03	0.05	0.07	0.08
Real investment	-0.29	0.00	0.13	0.12	0.09	0.06	0.04	0.02	0.01	0.00	0.00
Real exports	-0.02	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Real imports	-0.31	-0.20	-0.09	-0.05	-0.03	-0.01	-0.01	0.00	0.01	0.02	0.02
Output gap (per cent of GDP)*	-0.14	-0.09	-0.06	-0.04	-0.01	0.01	0.01	0.01	0.01	0.01	0.01
Current account (per cent of GDP)*	0.26	0.19	0.11	0.06	0.04	0.02	0.01	0.01	0.00	0.00	-0.01
Real effective exchange rate	-0.01	-0.05	-0.06	-0.04	-0.03	-0.02	-0.02	-0.01	0.00	0.00	0.01
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.01	-0.04	-0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01
Consumer expenditure deflator	-0.01	-0.05	-0.06	-0.05	-0.03	-0.03	-0.02	-0.01	-0.01	0.00	0.01
GDP deflator	-0.01	-0.04	-0.05	-0.03	-0.02	-0.01	-0.01	0.00	0.00	0.01	0.02
Policy interest rate*	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP)*	-0.87	0.07	-0.02	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01	0.00	0.00
Government debt (per cent of GDP)*	-0.42	-0.67	-0.69	-0.73	-0.75	-0.76	-0.76	-0.76	-0.77	-0.76	-0.76
Spillovers: Real GDP level											
Belgium	-0.02	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.02	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 35. Austria, temporary income tax shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.13	-0.07	-0.05	-0.04	-0.03	-0.03	-0.02	-0.01	-0.01	0.00	0.00
Real consumption	-0.53	-0.29	-0.24	-0.20	-0.17	-0.14	-0.11	-0.09	-0.07	-0.05	-0.03
Real investment	-0.19	0.05	0.05	0.04	0.03	0.02	0.02	0.01	0.01	0.01	0.01
Real exports	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Real imports	-0.36	-0.13	-0.10	-0.09	-0.08	-0.07	-0.06	-0.05	-0.04	-0.03	-0.02
Output gap (per cent of GDP)*	-0.10	-0.06	-0.05	-0.04	-0.03	-0.02	-0.02	-0.01	-0.01	0.00	0.00
Current account (per cent of GDP)*	0.19	0.08	0.07	0.06	0.05	0.05	0.04	0.03	0.03	0.03	0.02
Real effective exchange rate	-0.01	-0.04	-0.04	-0.03	-0.03	-0.03	-0.02	-0.02	-0.02	-0.01	-0.01
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.01	-0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer expenditure deflator	-0.01	-0.04	-0.04	-0.03	-0.03	-0.03	-0.03	-0.02	-0.02	-0.02	-0.01
GDP deflator	-0.01	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.02	-0.02	-0.02	-0.01
Policy interest rate*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP)*	-0.92	0.02	0.00	0.00	0.00	-0.01	-0.01	0.00	-0.01	-0.01	-0.01
Government debt (per cent of GDP)*	-0.46	-0.77	-0.73	-0.71	-0.69	-0.68	-0.68	-0.67	-0.67	-0.67	-0.67
Spillovers: Real GDP level											
Belgium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 36. Portugal, temporary income tax shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.11	-0.17	-0.11	-0.08	-0.05	-0.04	-0.03	-0.02	-0.01	0.00	0.00
Real consumption	-0.28	-0.44	-0.31	-0.25	-0.20	-0.16	-0.14	-0.11	-0.08	-0.06	-0.03
Real investment	-0.18	-0.13	0.02	0.06	0.06	0.05	0.04	0.03	0.03	0.03	0.03
Real exports	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
Real imports	-0.21	-0.28	-0.17	-0.13	-0.11	-0.10	-0.08	-0.07	-0.06	-0.04	-0.03
Output gap (per cent of GDP)*	-0.07	-0.11	-0.08	-0.07	-0.06	-0.04	-0.03	-0.02	-0.01	-0.01	0.00
Current account (per cent of GDP)*	0.09	0.12	0.08	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03
Real effective exchange rate	0.00	-0.02	-0.04	-0.05	-0.06	-0.05	-0.05	-0.05	-0.04	-0.03	-0.03
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	0.00	-0.02	-0.02	-0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01
Consumer expenditure deflator	0.00	-0.02	-0.04	-0.05	-0.06	-0.05	-0.05	-0.05	-0.04	-0.03	-0.03
GDP deflator	0.00	-0.02	-0.04	-0.05	-0.06	-0.06	-0.05	-0.05	-0.04	-0.03	-0.03
Policy interest rate*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP)*	-0.95	0.06	0.00	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Government debt (per cent of GDP)*	-0.45	-0.61	-0.60	-0.62	-0.64	-0.65	-0.65	-0.65	-0.66	-0.67	-0.68
Spillovers: Real GDP level											
Belgium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 37. Spain, temporary income tax shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.22	-0.18	-0.06	0.00	0.02	0.01	0.01	0.00	0.01	0.01	0.02
Real consumption	-0.52	-0.49	-0.34	-0.23	-0.16	-0.11	-0.06	-0.02	0.01	0.04	0.06
Real investment	-0.40	0.00	0.24	0.23	0.14	0.06	0.02	0.01	0.01	0.01	0.01
Real exports	-0.01	0.02	0.08	0.08	0.03	-0.01	-0.02	-0.03	-0.02	-0.02	-0.01
Real imports	-0.48	-0.31	-0.19	-0.19	-0.20	-0.18	-0.13	-0.07	-0.02	0.02	0.05
Output gap (per cent of GDP)*	-0.16	-0.12	-0.07	-0.05	-0.02	0.00	0.01	0.01	0.00	0.01	0.01
Current account (per cent of GDP)*	0.16	0.11	0.09	0.09	0.09	0.07	0.05	0.03	0.02	0.01	0.00
Real effective exchange rate	-0.03	-0.13	-0.21	-0.20	-0.15	-0.09	-0.05	-0.01	0.01	0.02	0.03
Nominal effective exchange rate	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	-0.01	-0.02	-0.02	-0.02	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	-0.01	-0.02	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	-0.02	-0.11	-0.08	0.00	0.05	0.06	0.05	0.03	0.02	0.01	0.01
Consumer expenditure deflator	-0.02	-0.13	-0.20	-0.20	-0.15	-0.10	-0.05	-0.02	0.00	0.01	0.02
GDP deflator	-0.01	-0.12	-0.20	-0.19	-0.13	-0.08	-0.03	0.00	0.01	0.02	0.03
Policy interest rate*	0.00	-0.02	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP)*	-0.89	0.07	-0.01	-0.02	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Government debt (per cent of GDP)*	-0.28	-0.44	-0.44	-0.53	-0.60	-0.65	-0.68	-0.70	-0.72	-0.73	-0.75
Spillovers: Real GDP level											
Belgium	-0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	-0.03	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00
Euro Area	-0.03	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

VAT shock

Table 38. Belgium, temporary VAT shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.06	-0.03	-0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Real consumption	-0.22	-0.06	-0.04	-0.04	-0.04	-0.04	-0.03	-0.03	-0.02	-0.01	-0.01
Real investment	-0.04	0.04	0.07	0.06	0.04	0.03	0.02	0.01	0.01	0.00	0.00
Real exports	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Real imports	-0.08	0.00	0.02	0.01	0.00	-0.01	-0.02	-0.02	-0.02	-0.01	-0.01
Output gap (per cent of GDP)*	0.06	-0.01	-0.09	-0.07	-0.03	-0.02	-0.01	0.00	0.00	0.00	0.00
Current account (per cent of GDP)*	0.03	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Real effective exchange rate	1.00	0.02	-0.01	-0.03	-0.04	-0.04	-0.04	-0.03	-0.02	-0.01	0.00
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	1.01	-0.98	-0.04	-0.02	-0.01	0.00	0.01	0.01	0.01	0.01	0.01
Consumer expenditure deflator	1.00	0.02	-0.01	-0.03	-0.04	-0.04	-0.04	-0.03	-0.02	-0.01	0.00
GDP deflator	0.98	0.04	0.01	-0.01	-0.02	-0.02	-0.01	-0.01	0.00	0.01	0.02
Policy interest rate*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP)*	-0.75	-0.04	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government debt (per cent of GDP)*	-1.44	-0.73	-0.69	-0.63	-0.60	-0.58	-0.57	-0.57	-0.57	-0.56	-0.56
Spillovers: Real GDP level											
Finland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 39. Finland, temporary VAT shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.10	-0.01	0.06	0.04	0.01	0.00	0.01	0.01	0.01	0.00	0.00
Real consumption	-0.29	-0.03	0.03	-0.03	-0.07	-0.07	-0.04	-0.02	-0.02	-0.03	-0.02
Real investment	-0.11	-0.01	-0.01	-0.03	-0.01	0.01	0.01	0.00	-0.01	-0.01	0.00
Real exports	-0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
Real imports	-0.20	0.01	-0.01	-0.08	-0.11	-0.10	-0.07	-0.05	-0.04	-0.03	-0.02
Output gap (per cent of GDP)*	-0.08	-0.18	-0.18	0.00	0.12	0.08	-0.01	-0.03	0.00	0.02	0.01
Current account (per cent of GDP)*	0.07	0.03	0.04	0.01	0.00	0.02	0.03	0.02	0.01	0.00	0.00
Real effective exchange rate	0.70	-0.21	-0.19	-0.10	-0.07	-0.08	-0.07	-0.04	-0.01	0.00	0.00
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	0.70	-0.91	0.03	0.09	0.03	-0.01	0.01	0.03	0.03	0.01	0.00
Consumer expenditure deflator	0.70	-0.21	-0.19	-0.10	-0.07	-0.08	-0.07	-0.04	-0.01	0.00	0.00
GDP deflator	0.70	-0.21	-0.18	-0.09	-0.06	-0.07	-0.07	-0.04	-0.01	0.01	0.01
Policy interest rate*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP)*	-0.74	-0.10	-0.01	0.10	0.05	-0.02	-0.03	0.00	0.01	0.01	0.00
Government debt (per cent of GDP)*	-0.84	-0.63	-0.73	-0.67	-0.57	-0.53	-0.55	-0.57	-0.55	-0.52	-0.50
Spillovers: Real GDP level											
Belgium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 40. France, temporary VAT shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.15	0.00	0.06	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.04
Real consumption	-0.49	-0.07	0.00	0.00	-0.02	-0.02	-0.01	0.01	0.02	0.03	0.04
Real investment	-0.06	0.21	0.21	0.12	0.06	0.03	0.02	0.01	0.00	-0.01	-0.01
Real exports	-0.09	0.07	0.15	0.13	0.09	0.07	0.04	0.03	0.02	0.00	0.00
Real imports	-0.47	0.10	0.16	0.08	-0.01	-0.06	-0.07	-0.08	-0.07	-0.06	-0.04
Output gap (per cent of GDP)*	-0.06	-0.08	-0.16	-0.09	-0.01	0.02	0.03	0.03	0.03	0.03	0.02
Current account (per cent of GDP)*	0.13	-0.06	-0.06	-0.03	-0.01	0.01	0.01	0.02	0.02	0.01	0.01
Real effective exchange rate	1.11	-0.26	-0.28	-0.23	-0.17	-0.12	-0.08	-0.05	-0.02	0.00	0.02
Nominal effective exchange rate	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.21	-0.06	-0.06	-0.05	-0.03	-0.02	-0.02	-0.01	-0.01	0.00	0.00
EA wide nominal effective exchange rate	-0.02	-0.02	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	1.13	-1.37	-0.03	0.05	0.06	0.05	0.04	0.03	0.03	0.02	0.02
Consumer expenditure deflator	1.12	-0.25	-0.28	-0.23	-0.18	-0.13	-0.09	-0.06	-0.03	-0.01	0.01
GDP deflator	1.18	-0.31	-0.34	-0.29	-0.22	-0.15	-0.10	-0.06	-0.03	0.00	0.02
Policy interest rate*	0.00	-0.03	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP)*	-0.68	-0.08	-0.03	0.04	0.03	0.01	0.00	-0.01	0.00	0.00	0.00
Government debt (per cent of GDP)*	-1.44	-0.35	-0.44	-0.47	-0.48	-0.50	-0.52	-0.55	-0.56	-0.58	-0.58
Spillovers: Real GDP level											
Belgium	-0.04	0.02	0.03	0.01	0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Finland	-0.01	0.02	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Germany	-0.01	0.01	0.01	0.01	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01
Greece	-0.01	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	-0.01	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.03	0.02	0.04	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Austria	-0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	-0.03	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Spain	-0.01	0.00	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.04	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01

Notes: see table 5.

Table 41. Germany, temporary VAT shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.28	0.05	0.08	0.11	0.11	0.11	0.10	0.08	0.06	0.05	0.03
Real consumption	-1.09	0.03	0.01	0.05	0.04	0.03	0.03	0.04	0.04	0.05	0.05
Real investment	-0.35	0.31	0.20	0.11	0.05	0.00	-0.03	-0.05	-0.06	-0.06	-0.06
Real exports	-0.19	0.23	0.24	0.21	0.15	0.10	0.05	0.01	-0.02	-0.04	-0.05
Real imports	-1.13	0.34	0.23	0.14	0.02	-0.05	-0.10	-0.12	-0.12	-0.11	-0.09
Output gap (per cent of GDP)*	-0.26	-0.16	-0.04	0.12	0.10	0.09	0.09	0.08	0.07	0.05	0.04
Current account (per cent of GDP)*	0.25	-0.11	-0.07	-0.04	-0.01	0.02	0.03	0.04	0.04	0.03	0.03
Real effective exchange rate	1.48	-0.46	-0.35	-0.32	-0.23	-0.15	-0.07	-0.01	0.04	0.08	0.10
Nominal effective exchange rate	-0.01	-0.02	-0.02	-0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01
EA wide real effective exchange rate	0.39	-0.15	-0.12	-0.10	-0.07	-0.04	-0.02	0.00	0.01	0.02	0.02
EA wide nominal effective exchange rate	-0.01	-0.04	-0.04	-0.02	-0.01	0.00	0.01	0.02	0.02	0.02	0.02
Headline CPI Inflation*	1.50	-1.97	0.10	0.03	0.08	0.08	0.08	0.07	0.05	0.04	0.02
Consumer expenditure deflator	1.49	-0.48	-0.38	-0.35	-0.28	-0.19	-0.12	-0.05	0.00	0.04	0.06
GDP deflator	1.40	-0.63	-0.48	-0.44	-0.33	-0.22	-0.12	-0.03	0.03	0.08	0.11
Policy interest rate*	0.00	-0.03	-0.04	-0.03	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP)*	-0.60	-0.12	0.09	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government debt (per cent of GDP)*	-1.35	-0.18	-0.26	-0.29	-0.38	-0.46	-0.52	-0.56	-0.58	-0.59	-0.58
Spillovers: Real GDP level											
Belgium	-0.12	0.06	0.06	0.04	0.01	-0.01	-0.02	-0.02	-0.02	-0.02	-0.01
Finland	-0.06	0.06	0.04	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00
France	-0.05	0.03	0.03	0.02	0.01	0.00	-0.01	-0.01	-0.01	-0.01	-0.01
Greece	-0.07	0.03	0.05	0.03	0.01	0.00	-0.01	-0.01	-0.01	0.00	0.00
Ireland	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.02
Italy	-0.03	0.00	0.02	0.03	0.02	0.01	0.01	0.00	0.00	0.00	-0.01
Netherlands	-0.16	0.07	0.09	0.06	0.03	0.01	-0.01	-0.01	-0.02	-0.02	-0.01
Austria	-0.07	-0.01	0.00	-0.01	-0.02	-0.02	-0.02	-0.02	-0.01	0.00	0.01
Portugal	-0.07	0.04	0.04	0.04	0.04	0.03	0.03	0.02	0.01	0.01	0.00
Spain	-0.02	-0.01	0.03	0.04	0.03	0.02	0.01	0.00	0.00	0.00	0.00
Euro Area	-0.12	0.03	0.05	0.05	0.04	0.03	0.03	0.02	0.01	0.01	0.01

Notes: see table 5.

Table 42. Greece, temporary VAT shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.12	-0.04	0.04	0.06	0.03	0.00	0.00	0.01	0.02	0.02	0.02
Real consumption	-0.25	-0.09	0.08	0.12	0.03	-0.05	-0.06	-0.03	-0.01	0.00	-0.01
Real investment	-0.21	0.49	0.36	0.08	-0.09	-0.08	-0.01	0.04	0.03	0.01	0.00
Real exports	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Real imports	-0.20	0.09	0.20	0.14	0.00	-0.08	-0.08	-0.05	-0.04	-0.04	-0.05
Output gap (per cent of GDP)*	0.12	0.04	-0.18	-0.17	-0.02	0.06	0.05	0.00	-0.01	0.00	0.01
Current account (per cent of GDP)*	0.09	-0.03	-0.07	-0.05	0.00	0.02	0.02	0.02	0.01	0.01	0.02
Real effective exchange rate	0.79	0.05	-0.06	-0.05	-0.04	-0.04	-0.05	-0.06	-0.05	-0.04	-0.03
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	0.82	-0.73	-0.11	0.00	0.01	0.00	-0.01	-0.01	0.00	0.01	0.01
Consumer expenditure deflator	0.80	0.05	-0.06	-0.05	-0.04	-0.04	-0.05	-0.06	-0.05	-0.04	-0.03
GDP deflator	0.79	0.05	-0.06	-0.06	-0.05	-0.05	-0.06	-0.06	-0.06	-0.05	-0.04
Policy interest rate*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP)*	-0.84	0.04	-0.09	-0.02	0.04	0.03	0.00	-0.01	-0.01	0.00	0.00
Government debt (per cent of GDP)*	-1.76	-0.78	-0.78	-0.85	-0.77	-0.66	-0.61	-0.62	-0.64	-0.65	-0.64
Spillovers: Real GDP level											
Belgium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 43. Ireland, temporary VAT shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.08	-0.04	0.10	0.11	0.08	0.07	0.07	0.05	0.03	0.01	-0.01
Real consumption	-0.36	-0.14	0.07	0.11	0.04	0.00	0.02	0.04	0.04	0.03	0.03
Real investment	-0.08	-0.11	0.05	0.06	0.03	0.00	-0.01	-0.03	-0.04	-0.05	-0.04
Real exports	-0.08	-0.04	0.02	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Real imports	-0.20	-0.09	-0.01	-0.03	-0.05	-0.05	-0.04	-0.03	-0.01	0.00	0.01
Output gap (per cent of GDP)*	0.02	-0.19	-0.18	0.07	0.18	0.09	0.02	0.03	0.04	0.02	0.00
Current account (per cent of GDP)*	0.26	-0.08	0.09	0.04	0.03	0.06	0.07	0.05	0.03	0.02	0.01
Real effective exchange rate	1.07	-0.30	-0.17	-0.02	-0.02	-0.05	-0.03	0.01	0.03	0.03	0.03
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	1.09	-1.38	0.13	0.16	0.00	-0.03	0.02	0.04	0.02	0.00	0.00
Consumer expenditure deflator	1.07	-0.30	-0.17	-0.02	-0.02	-0.05	-0.03	0.01	0.03	0.03	0.03
GDP deflator	0.93	-0.27	-0.13	-0.01	-0.01	-0.04	-0.02	0.02	0.03	0.03	0.03
Policy interest rate*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP)*	-0.78	-0.09	-0.06	0.10	0.06	-0.03	-0.03	0.01	0.02	0.01	0.00
Government debt (per cent of GDP)*	-1.36	-0.45	-0.79	-0.83	-0.67	-0.62	-0.65	-0.66	-0.61	-0.57	-0.54
Spillovers: Real GDP level											
Belgium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 44. Italy, temporary VAT shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.06	-0.05	0.03	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Real consumption	-0.20	-0.16	-0.08	-0.05	-0.04	-0.03	-0.02	-0.01	0.00	0.01	0.01
Real investment	-0.07	-0.01	0.07	0.02	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00
Real exports	-0.01	0.02	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Real imports	-0.25	-0.14	-0.12	-0.14	-0.11	-0.06	-0.03	-0.01	0.00	0.01	0.02
Output gap (per cent of GDP)*	-0.06	-0.12	-0.07	0.00	0.03	0.02	0.00	-0.01	0.00	0.00	0.00
Current account (per cent of GDP)*	0.04	0.05	0.06	0.05	0.03	0.02	0.01	0.01	0.00	0.00	0.00
Real effective exchange rate	0.76	-0.27	-0.21	-0.08	-0.02	-0.01	-0.01	0.00	0.00	0.01	0.01
Nominal effective exchange rate	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.10	-0.05	-0.02	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	-0.02	-0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	0.77	-1.05	0.05	0.14	0.06	0.01	0.00	0.01	0.01	0.00	0.00
Consumer expenditure deflator	0.77	-0.27	-0.22	-0.08	-0.02	-0.01	-0.02	-0.01	0.00	0.00	0.01
GDP deflator	0.74	-0.26	-0.21	-0.07	-0.01	-0.01	-0.01	0.00	0.01	0.01	0.01
Policy interest rate*	0.00	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP)*	-0.85	-0.03	-0.02	0.02	0.01	0.00	-0.01	0.00	0.00	0.00	0.00
Government debt (per cent of GDP)*	-1.57	-0.35	-0.54	-0.71	-0.72	-0.69	-0.67	-0.66	-0.66	-0.65	-0.64
Spillovers: Real GDP level											
Belgium	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.01	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 45. Netherlands, temporary VAT shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.11	-0.02	0.08	0.09	0.05	0.01	0.01	0.02	0.02	0.01	0.00
Real consumption	-0.44	-0.16	0.09	0.19	0.10	-0.01	-0.02	0.00	0.02	0.02	0.01
Real investment	-0.07	0.07	0.11	0.02	-0.04	-0.04	-0.02	-0.01	-0.01	-0.02	-0.02
Real exports	-0.02	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Real imports	-0.14	-0.01	0.04	0.05	0.01	-0.02	-0.03	-0.01	0.00	0.00	0.00
Output gap (per cent of GDP)*	0.10	-0.12	-0.29	-0.09	0.12	0.12	0.02	-0.02	-0.01	0.02	0.02
Current account (per cent of GDP)*	-0.02	0.02	0.05	-0.03	-0.06	-0.03	0.01	0.01	-0.01	-0.02	-0.02
Real effective exchange rate	1.12	-0.33	-0.18	-0.01	0.02	-0.03	-0.05	-0.02	0.00	0.01	0.01
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.07	-0.02	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	-0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	1.13	-1.46	0.14	0.18	0.03	-0.04	-0.02	0.02	0.03	0.01	0.00
Consumer expenditure deflator	1.12	-0.33	-0.19	-0.02	0.02	-0.03	-0.05	-0.03	0.00	0.01	0.01
GDP deflator	1.01	-0.32	-0.16	0.01	0.04	-0.01	-0.03	-0.01	0.02	0.03	0.03
Policy interest rate*	0.00	-0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP)*	-0.64	-0.05	-0.12	0.09	0.11	0.02	-0.04	-0.03	0.00	0.01	0.00
Government debt (per cent of GDP)*	-1.02	-0.38	-0.68	-0.77	-0.62	-0.51	-0.51	-0.56	-0.57	-0.55	-0.53
Spillovers: Real GDP level											
Belgium	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	-0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 46. Austria, temporary VAT shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.05	-0.02	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Real consumption	-0.18	-0.09	-0.05	-0.05	-0.04	-0.03	-0.02	-0.01	-0.01	0.00	0.00
Real investment	-0.12	-0.06	0.04	0.02	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Real exports	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Real imports	-0.13	-0.06	-0.04	-0.04	-0.04	-0.03	-0.02	-0.01	-0.01	0.00	0.00
Output gap (per cent of GDP)*	-0.04	-0.07	-0.04	0.02	0.02	0.00	0.00	0.01	0.00	0.00	0.00
Current account (per cent of GDP)*	0.03	0.04	0.03	0.01	0.01	0.01	0.00	0.00	0.00	0.00	-0.01
Real effective exchange rate	0.67	-0.11	-0.03	0.00	-0.02	-0.02	-0.01	0.00	0.00	0.00	0.00
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	0.68	-0.80	0.08	0.03	-0.02	0.00	0.02	0.01	0.00	0.00	0.00
Consumer expenditure deflator	0.67	-0.11	-0.03	0.00	-0.02	-0.02	-0.01	0.00	0.00	0.00	0.00
GDP deflator	0.64	-0.10	-0.03	0.01	-0.02	-0.02	0.00	0.00	0.00	0.01	0.01
Policy interest rate*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP)*	-0.85	-0.05	0.00	0.04	0.00	-0.01	0.00	0.00	0.00	0.00	0.00
Government debt (per cent of GDP)*	-1.02	-0.72	-0.80	-0.75	-0.68	-0.68	-0.67	-0.65	-0.64	-0.63	-0.62
Spillovers: Real GDP level											
Belgium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 47. Portugal, temporary VAT shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.12	-0.06	0.00	0.03	0.03	0.01	0.00	-0.01	0.00	0.00	0.00
Real consumption	-0.32	-0.14	-0.05	0.02	0.02	-0.02	-0.05	-0.04	-0.03	-0.01	0.00
Real investment	-0.08	0.07	0.07	0.04	0.01	0.00	0.00	0.00	0.01	0.01	0.01
Real exports	-0.01	-0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Real imports	-0.21	-0.04	0.01	0.03	0.00	-0.03	-0.04	-0.03	-0.02	-0.01	0.00
Output gap (per cent of GDP)*	0.07	-0.05	-0.21	-0.12	0.03	0.06	0.02	-0.02	-0.02	-0.01	0.00
Current account (per cent of GDP)*	0.11	0.01	0.01	0.00	0.00	0.01	0.02	0.02	0.01	0.01	0.01
Real effective exchange rate	0.92	-0.02	-0.05	-0.04	-0.03	-0.02	-0.02	-0.02	-0.01	-0.01	-0.01
Nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	0.93	-0.97	-0.03	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
Consumer expenditure deflator	0.92	-0.02	-0.05	-0.04	-0.03	-0.02	-0.02	-0.01	-0.01	-0.01	0.00
GDP deflator	0.94	-0.01	-0.05	-0.03	-0.02	-0.01	0.00	0.00	0.00	0.01	0.01
Policy interest rate*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP)*	-0.69	-0.04	-0.06	0.05	0.06	0.02	-0.02	-0.02	-0.01	0.00	0.00
Government debt (per cent of GDP)*	-1.51	-0.55	-0.63	-0.65	-0.58	-0.51	-0.49	-0.50	-0.51	-0.50	-0.50
Spillovers: Real GDP level											
Belgium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Austria	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euro Area	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: see table 5.

Table 48. Spain, temporary VAT shock

Year	1	2	3	4	5	6	7	8	9	10	11
Real GDP level	-0.19	0.00	0.22	0.21	0.10	0.01	-0.02	-0.02	0.00	0.01	0.02
Real consumption	-0.42	-0.06	0.08	0.07	0.02	0.00	0.01	0.03	0.04	0.05	0.06
Real investment	-0.19	0.33	0.48	0.14	-0.14	-0.20	-0.14	-0.06	0.00	0.02	0.02
Real exports	-0.04	-0.01	0.23	0.17	-0.01	-0.10	-0.09	-0.05	-0.01	0.00	0.00
Real imports	-0.32	0.14	0.10	-0.18	-0.32	-0.27	-0.12	0.00	0.07	0.08	0.07
Output gap (per cent of GDP)*	-0.04	-0.20	-0.19	-0.03	0.09	0.08	0.04	0.00	-0.01	0.00	0.01
Current account (per cent of GDP)*	0.09	-0.06	0.01	0.10	0.11	0.07	0.02	-0.01	-0.02	-0.02	-0.02
Real effective exchange rate	1.20	-0.33	-0.46	-0.32	-0.14	-0.01	0.05	0.06	0.04	0.03	0.03
Nominal effective exchange rate	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EA wide real effective exchange rate	0.11	-0.05	-0.04	-0.02	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
EA wide nominal effective exchange rate	-0.03	-0.02	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Headline CPI Inflation*	1.23	-1.55	-0.15	0.14	0.18	0.13	0.06	0.01	-0.01	-0.01	0.00
Consumer expenditure deflator	1.22	-0.31	-0.46	-0.32	-0.14	-0.01	0.05	0.05	0.04	0.03	0.02
GDP deflator	1.20	-0.34	-0.50	-0.31	-0.11	0.02	0.06	0.06	0.05	0.03	0.03
Policy interest rate*	0.00	-0.03	-0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Government deficit (per cent of GDP)*	-0.67	-0.08	-0.01	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00
Government debt (per cent of GDP)*	-1.60	-0.26	-0.38	-0.53	-0.58	-0.58	-0.57	-0.56	-0.55	-0.54	-0.54
Spillovers: Real GDP level											
Belgium	0.00	0.02	0.01	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00
Finland	0.00	0.02	0.01	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
France	0.00	0.01	0.01	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.01	0.01	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00
Greece	0.00	0.01	0.01	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.01	0.01	0.00	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00
Italy	0.00	0.01	0.00	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00
Netherlands	-0.01	0.02	0.01	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00
Austria	0.00	0.01	0.01	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00
Portugal	-0.02	0.01	0.01	-0.01	-0.02	-0.02	-0.01	0.00	0.00	0.00	0.00
Euro Area	-0.02	0.01	0.03	0.02	0.00	0.00	-0.01	0.00	0.00	0.00	0.00

Notes: see table 5.

Appendix B

The following tables report the percentage increase compared to the results reported in Table 2 in the spillover multiplier that result from increasing the proportion of liquidity constrained individuals and firms by 10, 20, 30 and 40 per cent. Both tables report the results obtained under the scenario where we shock the income tax rate. Very similar results are obtained when shocking VAT.

Table 49. Percentage increase in spillover multiplier from an income tax shock in Germany

	Increase in share of agents facing liquidity constraints			
	10%	20%	30%	40%
Belgium	9.5	19.9	30.0	41.5
Finland	9.8	20.1	31.4	42.8
France	10.6	21.2	33.3	45.7
Greece	16.4	36.1	59.2	87.0
Ireland	11.8	26.1	40.8	56.3
Italy	11.0	23.1	36.0	50.3
Netherlands	9.2	19.0	29.6	40.9
Austria	10.5	21.7	33.3	45.7
Portugal	9.5	19.7	30.4	41.8
Spain	14.7	31.9	50.0	70.9

Table 50. Percentage increase in spillover multiplier from an income tax shock in France

	Increase in share of agents facing liquidity constraints			
	10%	20%	30%	40%
Belgium	12.7	27.1	42.0	57.7
Finland	14.8	31.2	49.9	68.3
Germany	14.8	29.3	45.9	62.9
Greece	20.9	47.0	78.4	116.2
Ireland	9.4	29.9	53.5	70.1
Italy	14.8	31.1	48.6	67.7
Netherlands	13.4	28.4	45.1	62.3
Austria	17.4	37.0	58.1	80.0
Portugal	13.4	27.4	42.5	58.5
Spain	17.0	36.8	58.8	82.7

Appendix C

Table 7 lists the estimates of the import intensity coefficients of the modified import equations where we split total final expenditure (TFE) into its subcomponents.

The new import equation becomes

$$\Delta \log(MVOL_t) = \alpha_0 + \lambda[\log(MVOL_{t-1}) - \beta_0 \log(TFE_{t-1}) - \beta_1 \log(RPM_{t-1})] + \alpha_1 \log(RPM_t) + \alpha_2[\omega_0 \Delta \log(GC_t) + \omega_1 \Delta \log(C_t) + \omega_2 \Delta \log(GFCF_t) + \omega_3 \Delta \log(XVOL_t) + \omega_4 \Delta \log(DS_t + RES_t)],$$

The values in the second, third, fourth and fifth column correspond to ω_0, ω_1, ω_2 and ω_3, respectively.

Table 51. Import Equations: Import Intensity Coefficients

	Private Cons.	Public Cons.	Investment	Exports
Belgium	0.174	0.064	0.257	0.305
Finland	0.193	0.086	0.234	0.287
France	0.208	0.08	0.233	0.279
Germany	0.179	0.068	0.247	0.306
Greece	0.199	0.082	0.293	0.226
Ireland	0.204	0.079	0.228	0.289
Italy	0.201	0.068	0.258	0.274
Netherlands	0.176	0.065	0.228	0.33
Austria	0.179	0.072	0.266	0.284
Portugal	0.203	0.067	0.253	0.277
Spain	0.196	0.093	0.231	0.280

Note: the residual category (ω_4) carries the weight of the average of all the remaining components so it equals 0.2 for all countries.

Appendix D

The following set of figures displays the first year fiscal multiplier of the country that receives the fiscal impulse and the first year fiscal spillover multiplier of all the remaining EA countries. In all figures, the panel on the left corresponds to a shock on government consumption while the panel on the right to a shock to the income tax rate. The title reports the country where the shock has taken place.

Figure 5. Belgium: Comparison of spillover multipliers from a 1% of GDP fiscal contraction.

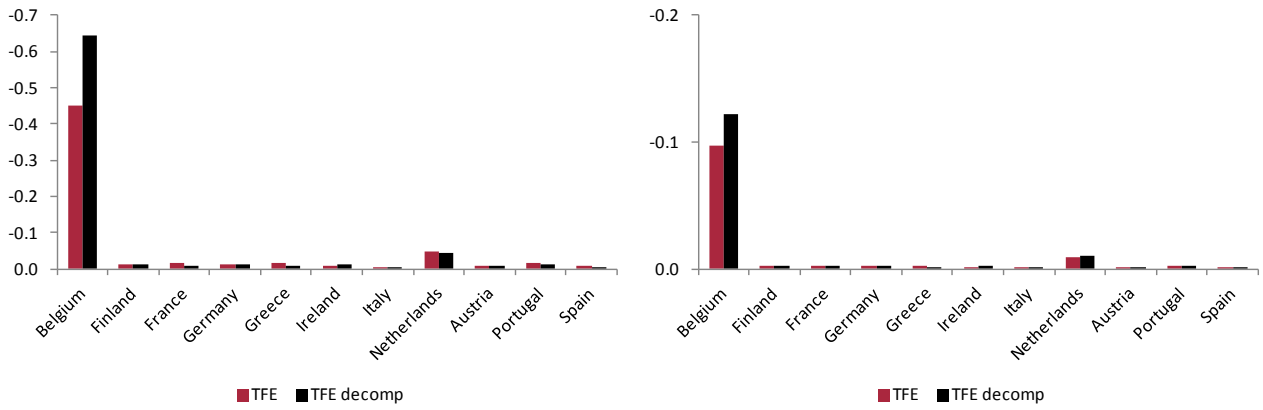

Figure 6. Finland: Comparison of spillover multipliers from a 1% of GDP fiscal contraction.

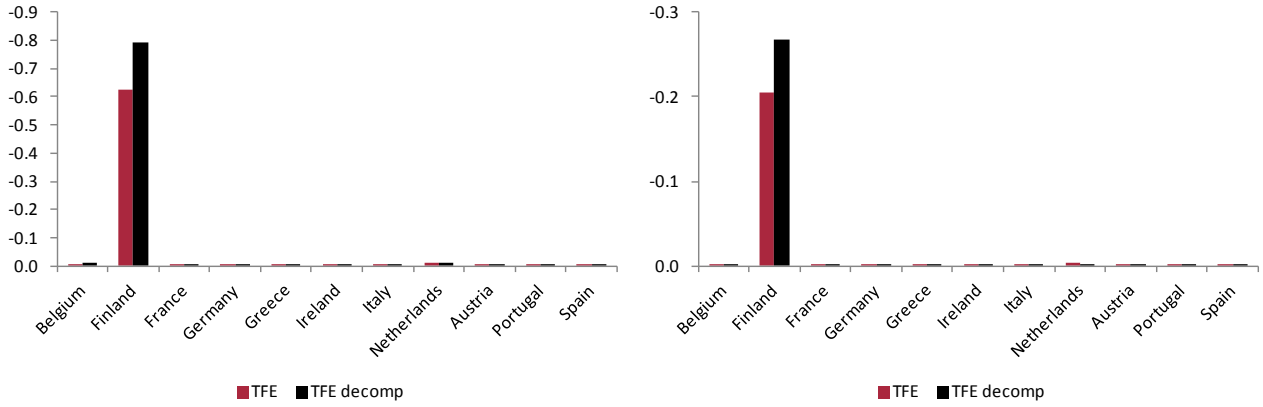

Figure 7. France: Comparison of spillover multipliers from a 1% of GDP fiscal contraction.

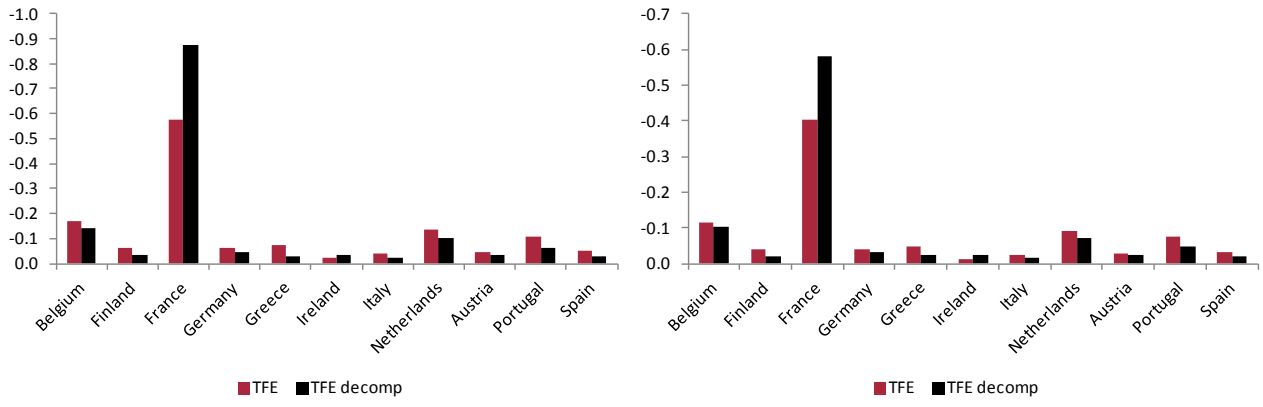

Figure 8. Greece: Comparison of spillover multipliers from a 1% of GDP fiscal contraction.

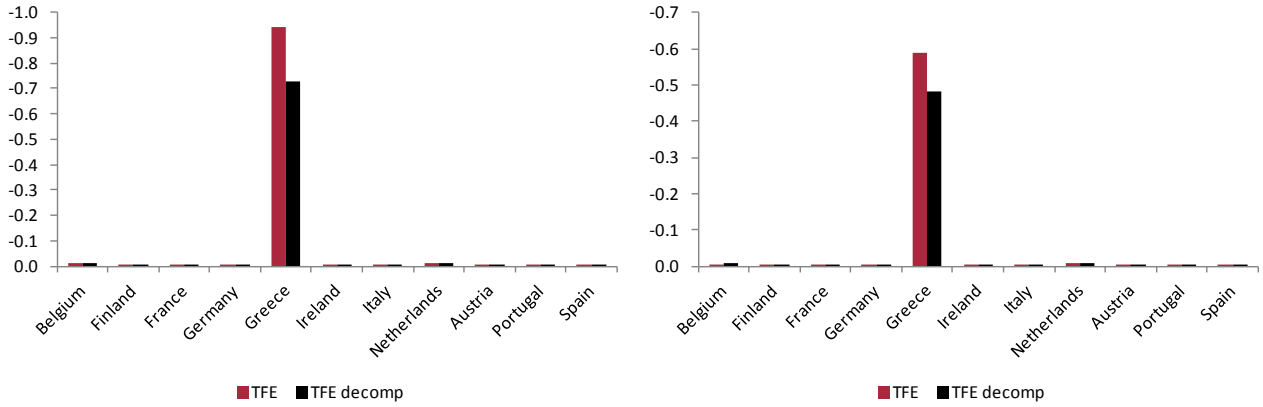

Figure 9. Ireland: Comparison of spillover multipliers from a 1% of GDP fiscal contraction.

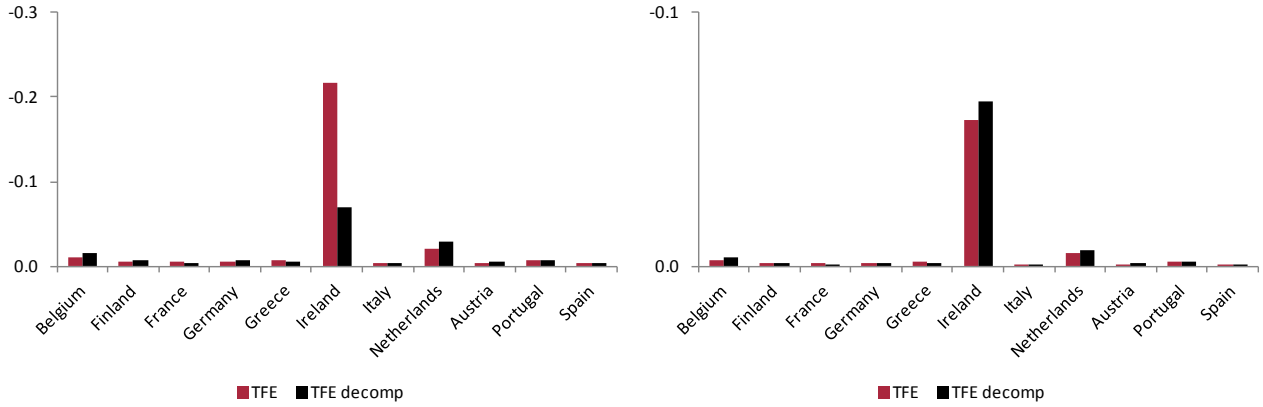

Figure 10. Italy: Comparison of spillover multipliers from a 1% of GDP fiscal contraction.

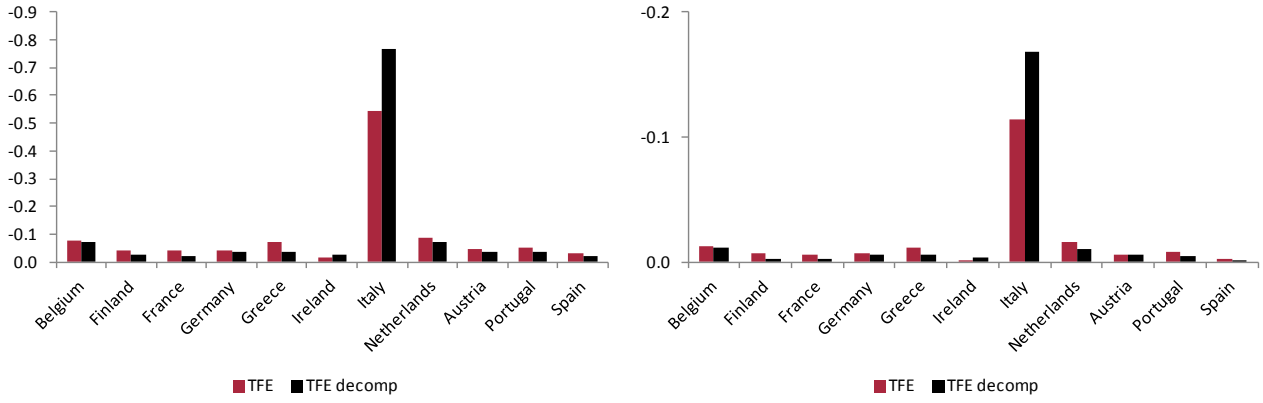

Figure 11. Netherlands: Comparison of spillover multipliers from a 1% of GDP fiscal contraction.

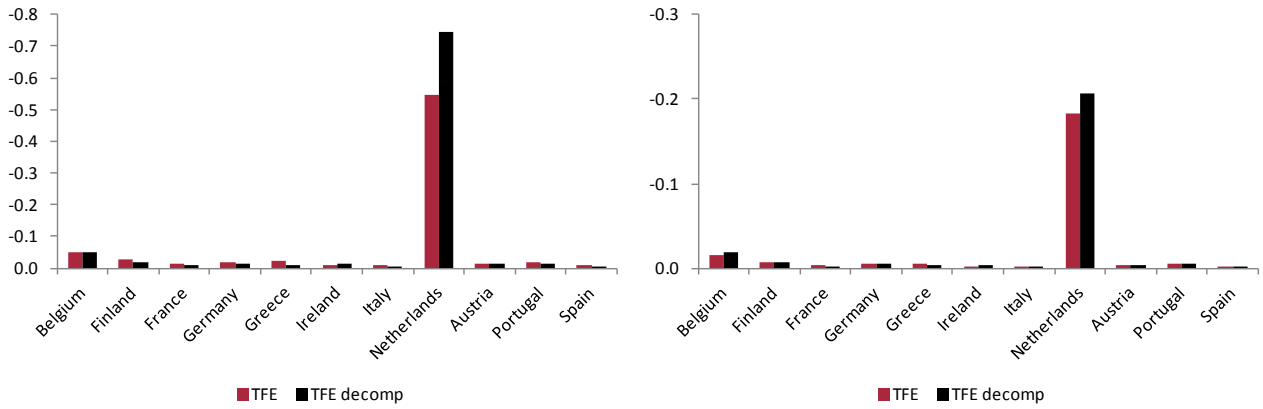

Figure 12. Austria: Comparison of spillover multipliers from a 1% of GDP fiscal contraction.

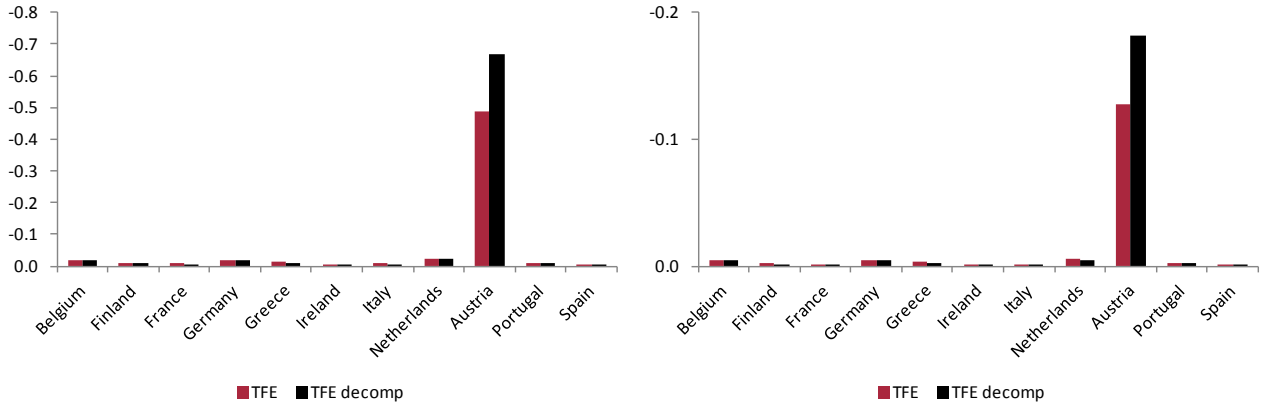

Figure 13. Portugal: Comparison of spillover multipliers from a 1% of GDP fiscal contraction.

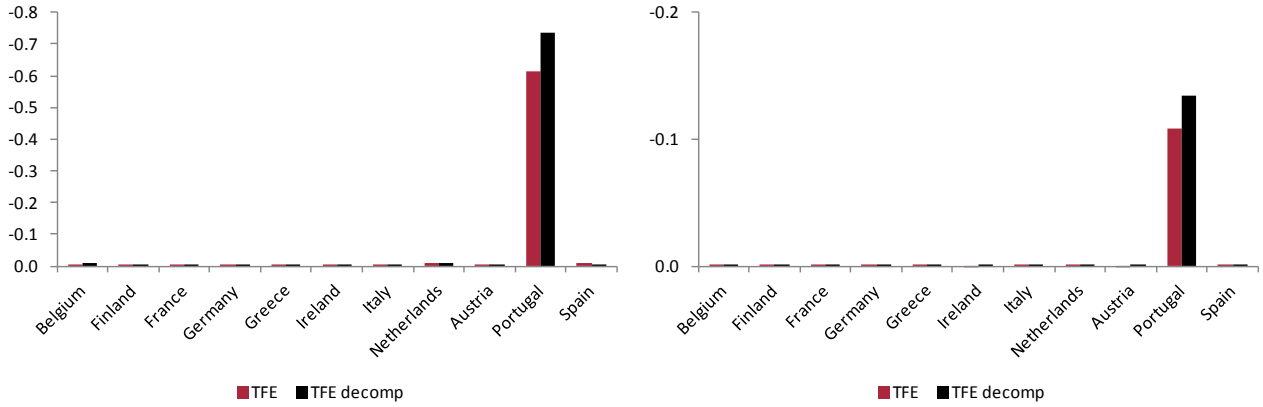

Figure 14. Spain: Comparison of spillover multipliers from a 1% of GDP fiscal contraction.