



BANK OF GREECE  
EUROSYSTEM

# Working Paper

Fiscal policy, net exports, and the  
sectoral composition of output  
in Greece

Athanasios O. Tagkalakis

186

SEPTEMBER 2014 WORKINGPAPERWORKINGPAPERWORKINGPAPERWORK

BANK OF GREECE

Economic Analysis and Research Department – Special Studies Division

21, E. Venizelos Avenue

GR-102 50 Athens

Tel: +30210-320 3610

Fax: +30210-320 2432

[www.bankofgreece.gr](http://www.bankofgreece.gr)

*Printed in Athens, Greece*

*at the Bank of Greece Printing Works.*

*All rights reserved. Reproduction for educational and*

*non-commercial purposes is permitted provided that the source is acknowledged.*

ISSN 1109-6691

# FISCAL POLICY, NET EXPORTS, AND THE SECTORAL COMPOSITION OF OUTPUT IN GREECE

Athanasios O. Tagkalakis  
Bank of Greece

## Abstract

This paper investigates the effects of fiscal policy shocks on net export performance and the sectoral composition of output in Greece in the post 2000 period. A reduction in government spending (or a tax hike) exerts a negative response on output which reduces import demand. A cut back in government spending boosts exports through the labour cost competitiveness channel further improving net exports. Tax hikes in particular on social security contributions and other indirect taxes reduce export performance. Although real aggregate output declines following a cut in government spending, the tradable sector output responds positively, further improving net exports.

*Keywords:* Fiscal policy; net exports; tradable; non-tradable

*JEL Classification:* E62, E24, O52, H30

*Acknowledgements:* I would like to thank Christian Pierdzioch, Paul J. J. Welfens, Holger C. Wolf, Jürgen Wolters, two anonymous reviewers as well as Heather Gibson and Dimitris Malliaropoulos for their very useful comments. The views of the paper are my own and do not necessarily reflect those of the Bank of Greece. All remaining errors are mine.

## Correspondence:

Athanasios O. Tagkalakis  
Bank of Greece  
21 El. Venizelos Av. 10250  
Athens, Greece  
Email: [atagkalakis@bankofgreece.gr](mailto:atagkalakis@bankofgreece.gr)  
Tel.:0030-210-3202442  
Fax: 0030-210-3232025

## 1. Introduction

Since May 2010, Greece has been receiving international financial assistance from the EU and the International Monetary Fund (IMF 2010). The financing agreement involves the implementation of an Economic Adjustment Programme (EAP). The EAP aims at improving public finances via forceful fiscal consolidation and improving the potential of the Greek economy via a series of structural reforms. Fiscal consolidation and structural reforms will reduce the external and internal imbalances of the Greece economy and will rebalance the sources of growth away from consumption to investment and, in particular, net exports.

While the programme implementation is considered successful, given the achievement of a primary balance surplus in government accounts in 2013 for the first time since 2002 (IMF, 2014; Bank of Greece, 2014), it has come at a huge cost in terms of loss of output in the period 2010-2013. According to the projections of the initial programme Greece was expected to start recovering from 2012 onwards.<sup>1</sup> The latest European Commission forecasts (European Commission, 2014) reveal that the path has been quite different. From a mild recession of -0.2 in 2008 Greece went into a much deeper recession in the next years, i.e., -3.1% in 2009, -4.9% in 2010, -7.1% in 2011 and is now expected to be -6.4% in 2012, and -3.7% in 2013.

Nevertheless, the contribution of the external balance of goods and services to GDP growth is pretty much in line or even better (in the outer years of the programme) compared to the initial projections. In particular, the contribution of the external balance of goods and services is estimated at 3.1 percentage points (p.p.) in 2009, 2.9 p.p. in 2010, 2.4 p.p. in 2011 and 4.0 p.p. of GDP in 2012 and 2.8 p.p. in 2013.<sup>2</sup> Moreover, according to the European Commission (2014), Greece will start recovering in the second half of 2014 reaching a yearly growth rate of 0.6% and a positive net exports contribution of 1.8 p.p. of GDP.

Hence, the positive contribution from the improvement of the external sector counter-balanced the decline in domestic demand components over the programme

---

<sup>1</sup> Following a -2.0% growth rate in 2009, Greece was expected to reach a trough point in 2010 and start recovering thereafter, with the growth rates being -4.0% in 2010, -2.6% in 2011, 1.1% in 2012 and 2.1% in 2013 (European Commission, 2010).

<sup>2</sup> According to the initial programme the contribution of the external balance of goods and services was estimated at 0.7 p.p. in 2009, 3.5 p.p. in 2010, 3.2 p.p. in 2011, 1.7 p.p. in 2012 and 1.4 p.p. of GDP in 2013 (European Commission, 2010).

period. In more detail, net exports of goods and services improved from -14.5% of GDP in 2008 to -2.2% of GDP in 2013. This improvement is primarily attributed to net goods exports which improved from -20.9% of GDP in 2008 to -9.8% of GDP in 2013. This development reflects a fall in the demand for imported goods which from 31.6% of GDP in 2008 declined to 25.4% of GDP in 2013, on account of the fiscal consolidation and declining domestic incomes. Furthermore, the export of goods contributed to the improvement. In particular, the export of goods increased to 15.5% of GDP in 2013 from 10.7% of GDP in 2008 as a result of the improvement in competitiveness driven by structural labour and product market reforms (OECD, 2013a,b; IMF, 2014). It is worth highlighting that, in the period 2010-2013, Greece recouped the wage competitiveness losses occurred in the period 2000-2009 (Bank of Greece, 2014; OECD, 2013a,b; European Commission, 2013b; IMF, 2013). The services balance also contributed, albeit to a smaller extent to the improvement of the Greek external accounts. Net export of services increased from a 6.4% of GDP surplus in 2008 to a 7.6% of GDP surplus in 2013. This reflects the decline in imports of services from about 7.0% of GDP in 2008 to about 6.0% of GDP in 2013 due to the declining domestic demand. On other hand, the export of services stands at 13.6% of GDP in 2013 marginally higher compared to its 2008 level (13.4%). However, the exports of services increased in recent years from its lows of 10.6% of GDP recorded in 2010. It should be noted that the export of services represent more than 50% of Greece's exports of goods and services, reflecting the very important role of tourism and shipping services in the Greek economy.

In short, the on-going fiscal consolidation reduced domestic incomes lowering import demand and at the same time, by decreasing the size of the public sector, it freed resources to the private sector and in particular the tradable sector of the economy improving export performance. Both these forces contributed to raising net exports. On top of that, structural labour and product market reforms improved the competitiveness of the Greek economy, further raising export performance and leading to a positive net export contribution to real GDP growth over the crisis years.

In view of these developments and the key role that is attributed by the EAP to the external sector for the recovery of the Greek economy, this paper, following the SVAR approach of Blanchard and Perotti (2002), investigates the effects that fiscal policy changes have on net exports in Greece. Furthermore, in line with Benetrix and

Lane (2010) the paper examines whether a downsizing of the public sector can increase the relative share of the tradable sector, something that could have long-lasting positive effects on Greece's external balances. Our findings will reveal whether fiscal consolidation, besides its direct negative effects on output, can contribute to the improvement of the trade balance facilitating the achievement of economic recovery and a return to the markets.

According to our findings, a reduction in government spending (or a tax hike) exerts a negative response on output which reduces import demand. Following a cut in government spending exports increase on account of improvements in competitiveness, contributing to a positive net export response profile. However, tax hikes, in particular on social security contributions and other indirect taxes, worsen export performance.

Although real aggregate output declines following a cut in government spending, the output of the tradable sector responds positively. This implies that more resources are freed for the private sector, that are in turn directed to the more productive tradable sector further improving net export performance.

The remainder of the paper is organised as follows. The next section reviews the relevant international and Greek-specific literature on the effects of fiscal policy on net exports. Section 3 presents data information and discusses in more detail the econometric methodology. In section 4 we present the empirical findings. The last section includes a brief summary of the results and concluding remarks.

## **2. Relevant literature**

Several recent papers analyze the effects of fiscal policy in open economies. Under flexible exchange rates an increase in government spending cannot stimulate demand because the exchange rate appreciates leading to lower net exports. Under fixed exchange rates fiscal policy is more effective, because real exchange rate appreciation pressures are offset by monetary policy. Moreover it is shown that changes in government savings should lead to changes in the current account, in line with the twin deficits concept.

For example, Beetsma and Giuliadori (2011) examining 10 EU countries find that an increase in government purchases raises output, consumption and investment and reduces the trade balance. The stimulating effect is weaker and the trade balance reduction is larger for more open economies due to the trade leakage effects. As shown by Corsetti et al. (2012), an increase in government spending has a small positive effect on output, no significant effect on consumption and a fall in investment and the trade balance.

However, studies like Kim and Roubini (2008) and Corsetti and Muller (2008) find evidence that fiscal shocks identified through short-run restrictions in SVARs do not lead to twin deficits. Instead, fiscal expansion and increases in budget deficits lead to real exchange rate depreciations and current account surpluses (or no impact). As Kim and Roubini (2008) point out the change in government savings appears to go both to changes in private savings and changes in investment.

Lane and Perotti (1998) find that the composition of fiscal policy and the exchange rate regime matter for the impact on trade balances. Higher government consumption through spending on wages lowers exports and causes the trade balance to deteriorate under flexible exchange rates. Under fixed exchange rates there is no real exchange appreciation so the trade balance is not affected. Non-wage government consumption has limited effects on the trade balance. Monacelli and Perotti (2008) and Ravn et al. (2007) find that an increase in government spending raises output and consumption and causes the trade balance to deteriorate, while the real exchange rate depreciates (in Australia, Canada, UK and the US). Benetrix and Lane (2010) find a real effective exchange rate appreciation following a positive government spending shock. Moreover, Benetrix and Lane (2010) show that an increase in government spending matters not only for aggregate variables but also for the sectoral composition of output, i.e. the policy increases the relative size of the non-tradable sector, while imports increase and exports decline.

Turning to recent studies on Greece, Brissimis et al. (2010) find that in the period 1960-2007 the current account in Greece was influenced by factors such as fiscal balances, competitiveness, real convergence, private investment and macroeconomic uncertainty and financial liberalization. An increase in the fiscal deficit is only partially offset by an increase in private saving, thus widening the

current account deficit and providing evidence in favour of the twin deficit hypothesis and against the hypothesis of Ricardian equivalence.

Monokrousos and Thomakos (2012) find that the trend deterioration in the country's external imbalance in 1999-2008 can be traced back to a number of developments that took place over that period. These primarily relate to: 1) the EU convergence progress and closer integration in world goods and financial markets following the adoption of the euro; 2) the domestic authorities' response to the key policy challenges arising from participation in the single currency area; and 3) the structural characteristics and idiosyncrasies of the Greek economy. Their empirical results identify the following key drivers that contributed to the significant deterioration in the country's current account position in those years: (a) accumulated loss of competitiveness against main trade-partner economies; (b) pronounced fiscal policy relaxation following the adoption of the euro – in line with the “twin deficit” hypothesis; and (c) domestic financial deepening following the adoption of the euro.

### **3. Data information and baseline SVAR**

We use quarterly data from 2000:Q1 to 2013: Q1, covering the period that Greece was part of the euro area<sup>3</sup>. At the same time, this is the period that the statistical authorities of Greece started the production and dissemination of quarterly non-interpolated fiscal and economic activity data.<sup>4</sup> In view of the small sample size we consider a parsimonious specification which is a variant of those used in Blanchard and Perotti (2002), Monacelli and Perotti (2008), Castro and Garrote (2012) and Tagkalakis (2013). In order to examine the effects of government purchases shocks we consider the following 6 variable SVAR<sup>5</sup>: the log of real government purchases (which is the sum of government consumption and government investment), the log of real net taxes (total current revenue excluding current

---

<sup>3</sup> Greece became part of the euro area on 1 January 2001 but entry was decided upon in 2000; therefore we start our data set in 2000 because expectations of euro area entry were already formed at that time.

<sup>4</sup> It should be noted that all fiscal and economic activity data have been approved by Eurostat and are thus not subject to any statistical deficiencies. This point ought to be made clear from the start (see Eurostat, 2013) because of Greece's past troubles in the collection and reporting of fiscal data.

<sup>5</sup> Data were obtained from the International Financial Statistics of the IMF (IMF 2013b), the Economic Outlook of the OECD (2013b) and Eurostat (2014).



transfers)<sup>6</sup>, the log of real GDP, the log of real effective exchange rate (REER) in unit labor cost (ULC) terms<sup>7</sup>, the log of real exports of goods and services and the log of real imports of goods and services.<sup>8</sup> Fiscal variables and output are transformed into real terms using the GDP deflator, while in case of exports and imports own deflators have been used.<sup>9</sup>

The (lagged value of the) debt to GDP ratio is included as an exogenous variable to capture the constraints imposed on fiscal policy by debt developments in line with Favero and Giavazzi (2007). In addition, we include as an exogenous variable the lagged value of the oil price (in euros) to control for Greece's energy dependence (Greece's external balance is greatly affected by international oil prices developments). The SVAR specification includes an intercept, while the lag length is set to 1.<sup>10</sup> In addition we include a dummy variable, EAP, which takes value 1 from 2010 Q2 onwards and zero otherwise. EAP controls for two things: (1) the fact that Greece has been cut off from financial markets since the start of the EU-IMF finance programme, which in itself is a major structural change; and (2) the numerous structural reforms that have been undertaken over the period of the Economic Adjustment Programme (EAP) improving cost competitiveness (see e.g. European Commission, 2013; IMF, 2013a; OECD, 2013a,b).<sup>11</sup>

The SVAR we estimate is of the form:

$$X_t = A_1 * X_{t-1} + C_t + B * D_{t-1} + u_t \quad (1)$$

Where  $X_t = [G, T, Y, REER, X, M]$  is the vector of endogenous variables,  $C_t$  contains the deterministic terms and  $D_{t-1}$  is a vector that includes the debt to GDP ratio and oil price in euro terms.  $u_t$  are the VAR innovations. Building on the

<sup>6</sup> Given that we are subtracting current government transfers from the tax variable we do account for possible correlation in different government expenditure components (i.e., there is no need to add current transfers as a additional variable in the SVAR when we assess the effects of government purchases shocks).

<sup>7</sup> An increase in REER (in ULC terms) implies a worsening in cost competitiveness.

<sup>8</sup> We also report the impulse response of net exports which a constructed response following Beetsma et al 2008. The impulse response for the net exports to GDP ratio is constructed as  $[(X/Y)(\text{impX} - \text{impY}) - (M/Y)(\text{impM} - \text{impY})]$ , where X, M, Y are the sample means of export, import and GDP and  $\text{impX}$ ,  $\text{impM}$ ,  $\text{impY}$  are the impulse responses of export, import and GDP.

<sup>9</sup> To correct for seasonal patterns in the quarterly data we have applied the census X12 filter.

<sup>10</sup> The lag length was chosen based on non-autocorrelation and the information provided by relevant lag-length criteria.

<sup>11</sup> Several studies have examined the likely non-linear effects of fiscal policy in recession and expansions (e.g Tagkalakis, 2008), with the most recent employing the non-linear SVAR approach of Auerbach and Gorodnichenko (2012). Given that economic activity has been declining continuously since late 2008 in Greece there is limited data information to follow the above-mentioned approach; hence, it is left for future research.

Blanchard and Perotti (2002) SVAR approach we identify the structural shocks to G and T by imposing on the matrices A and B that determine the mapping from the VAR innovations  $u$  to the structural shocks  $\varepsilon$  ( $Au_t = B\varepsilon_t$ ) the following restrictions:

$$\begin{array}{c|c|c|c|c|c|c}
 \hline
 1 & 0 & \alpha_{gy} & \alpha_{greer} & \alpha_{gx} & \alpha_{gm} & u_{gt} \\
 \hline
 0 & 1 & \alpha_{ty} & \alpha_{treer} & \alpha_{tx} & \alpha_{tm} & u_{tt} \\
 \hline
 \alpha_{31} & \alpha_{32} & 1 & 0 & 0 & 0 & u_{yt} \\
 \hline
 \alpha_{41} & \alpha_{42} & \alpha_{43} & 1 & 0 & 0 & u_{reert} \\
 \hline
 \alpha_{51} & \alpha_{52} & \alpha_{53} & \alpha_{54} & 1 & 0 & u_{xt} \\
 \hline
 \alpha_{61} & \alpha_{62} & \alpha_{63} & \alpha_{64} & \alpha_{65} & 1 & u_{mt} \\
 \hline
 \end{array}
 \quad = \quad
 \begin{array}{c|c|c|c|c|c|c}
 \hline
 \beta_{11} & 0 & 0 & 0 & 0 & 0 & \varepsilon_{gt} \\
 \hline
 \beta_{21} & \beta_{22} & 0 & 0 & 0 & 0 & \varepsilon_{tt} \\
 \hline
 0 & 0 & \beta_{33} & 0 & 0 & 0 & \varepsilon_{yt} \\
 \hline
 0 & 0 & 0 & \beta_{44} & 0 & 0 & \varepsilon_{reert} \\
 \hline
 0 & 0 & 0 & 0 & \beta_{55} & 0 & \varepsilon_{xt} \\
 \hline
 0 & 0 & 0 & 0 & 0 & \beta_{66} & \varepsilon_{mt} \\
 \hline
 \end{array}$$

(1)

Following Blanchard and Perotti (2002), Beetsma et al. (2008) and Tagkalakis (2013) we set  $\alpha_{gy} = \alpha_{greer} = \alpha_{gx} = \alpha_{gm} = 0$ , and  $\alpha_{treer} = \alpha_{tx} = \alpha_{tm} = 0$  whereas using information from the Girouard and Andre (2005) we set  $\alpha_{ty} = 0.9$ ; we set  $\beta_{12} = 0$  and estimate  $\beta_{21}$ .<sup>12</sup> The above specification is used to examine the effect of a shock in government purchases on exports, imports, net exports, output and the real effective exchange rate. Besides this baseline SVAR we consider an alternative specification incorporating the real effective exchange rate in CPI (rather than in ULC) terms.

#### 4. Baseline findings

The baseline findings are presented in Figures 1-5. The solid green line in each figure represents the response profile of the variable of interest following a (negative) government purchases shock. The black round dot lines are the 68% confidence intervals, which have been calculated by bootstrapping the residuals (1000 bootstrap replications were performed). A 1 percentage point (p.p.) of GDP cut in government purchases improves net export performance (see Figure 1) for about 8-10 quarters, with the maximum effect of 0.35% of GDP occurring in 1-2 quarters after the shock. This is due to the improvement in cost competitiveness (REER in ULC terms declines

<sup>12</sup> We also considered the opposite case as in Blanchard and Perotti (2002) but the results are invariant to the ordering because the correlation between shocks is low enough and insignificant.

in Figure 2) which increases exports of goods and services for about 4 quarters (Figure 4). The maximum positive response of exports of about 0.18 p.p. of GDP occurs about 2 quarters after the shock. The cut in government purchases reduces output (see Figure 3), which in turn reduces the demand of import of goods and services (see Figure 5). On impact, output declines by 0.25 p.p. of GDP and imports by 0.15 p.p. of GDP. The maximum import response occurs 2 quarters after the shock and reaches 0.22 p.p of GDP.

As shown in Figure 2, during the first 4 quarters after the reduction in government purchases, price competitiveness (REER in CPI terms –red line) improves but to a smaller extent compared to labour cost competitiveness (REER in ULC terms-green line). Hence, a cut in government purchases reduces labour costs (in line the labour cost channel of Alesina et al 2002 and Lane and Perotti, 1998) but it does not lead to commensurable price reductions, possibly because profit margins/mark-ups increase. This implies that shocks to government purchases entail a countercyclical reaction of mark-ups (see Castro and Garrote, 2012). However, this could also be driven by significant structural rigidities that impair price adjustment.

[Figures 1-5 about here]

#### **4.1 Sectoral effects**

We next re-specify the baseline SVAR to account for the sectoral composition of output in line with Benetrix and Lane (2010). In more detail, in the 6-variable SVAR we substitute real GDP and REER for the log of non-tradable real output and the log of the tradable real output. We allocate sectors to the non-tradable and tradable sectors following Eurostat (2008), and earlier studies like Gibson and Malley (2008), and Benetrix and Lane (2010). That is real output in the non-tradable sector is the sum of the real value added in the following NACE Rev.2 sections (Eurostat, 2008): “Construction”, “Information and Communication”, “Financial and Insurance Activities”, “Real Estate Activities”, “Professional, scientific and technical activities, administrative and support service activities” and “Public administration and defence, compulsory social security, education, human health and social work activities”, “Arts, entertainment and recreation, repair of household goods and other services”. Real output in the tradable sector is the aggregate of the real value added in

“Agriculture, forestry and fishing”, “Mining and quarrying, manufacturing, electricity, gas, steam and air conditioning supply, water supply, sewerage, waste management and remediation activities”, “Wholesale and retail trade, repair of motor vehicles and motorcycles, transportation and storage, accommodation and food service activities”.<sup>13</sup>

The findings are reported in Figures 6-7. A 1 p.p. of GDP cut in government purchases lowers real output in the non-tradable sector, with the biggest fall of 0.3 p.p. of GDP being on impact. As shown in Figure 6 its impulse response remains negative for about 9 quarters after the shock, but then becomes positive in the outer quarters of the forecast horizon. By contrast, real output in the tradable sector responds positively over the entire forecast horizon. It reaches its maximum value of 0.12 p.p. of GDP about 6 quarters after the shock. This implies that a reduction in government spending (or a reduction in the size of the government), which is characterized by home-bias in view of its concentration on domestic non-tradable goods and services, will make more resources available to the private sector inducing a sectoral reallocation of resources towards (the more productive) tradable sectors which will in turn lead to a substantial increase in net exports.

[Figures 6-7 about here]

As a robustness check we re-arrange the above-mentioned NACE Rev. 2 sections to two categories: tradable-goods and services plus construction sectors. Basically, in the tradable-goods sector we include the categories “Agriculture, forestry and fishing” and “Mining and quarrying, manufacturing, electricity, gas, steam and air conditioning supply, water supply, sewerage, waste management and remediation activities”, i.e. agriculture and manufacturing goods. While the “Wholesale and retail trade, repair of motor vehicles and motorcycles, transportation and storage, accommodation and food service activities” is bundled with the remaining NACE rev.2 sections in the services and construction sector.<sup>14</sup> The impulse responses are shown in Figure 8 and 9. A cut in government purchases increases the real output of

---

<sup>13</sup> Given that the aggregate output elasticity of taxes was set to:  $\alpha_{ty}=0.9$  in (1) we set the tradable output (try) elasticity to taxes to  $\alpha_{ttry}=0.4$  and the non-tradable output (ntry) elasticity of taxes to  $\alpha_{nttry}=0.5$ , in line with the sample average of the share of the tradable and non-tradable to total real value added.

<sup>14</sup> Given that the aggregate output elasticity of taxes was set to:  $\alpha_{ty}=0.9$  in (1) we set the tradable-goods output (try) elasticity to taxes to  $\alpha_{ttry}=0.2$  and the services and construction output (ntry) elasticity of taxes to  $\alpha_{nttry}=0.7$ , in line with the share of the tradable-goods and services and construction to total real value added.

the tradable goods sector (Figure 8), with its maximum impact being about 0.075 p.p. of GDP 3-4 quarters after the shock. The real output of the services and construction sectors declines following a government purchases with its impact response being 0.4 p.p. of GDP. However, the response of the services and construction sector output turns positive 7-8 quarters after the initial shock (see Figure 9).

[Figures 8-9 about here]

Following Benetrix and Lane (2010) we account for the fact that government purchases may have different effects on the different industries within the non-tradables or services and construction sectors. Hence, we repeat the two previous exercises excluding each time the government component “Public administration and defence, compulsory social security, education, human health and social work activities” from the output of the non-tradable and services and construction sectors. That is we focus on market-based non-tradable sectors.<sup>15</sup>

The real output of the market non-tradable sector declines following a negative government purchases shock (Figure 11). Contrary to the finding for the non-tradable output (Figure 6) its maximum impact response is smaller (i.e. 0.2 versus 0.3 p.p. of GDP), while it takes longer (13 vis-à-vis 9 quarters) to return back to trend, and there is hardly any expansion in the remaining quarters until the end of the forecast horizon. The real output in the tradable sector still responds positively, but its impulse response is less smooth and less pronounced this time (see Figure 10 vis-à-vis Figure 7). The response of real output in the market-based services and construction sector is negative for the first 4 quarters, but then it becomes positive and persistent (Figure 13). The impulse response profile implies that the negative impact response is less pronounced (i.e. about 0.125 vis-à-vis 0.4 p.p. of GDP in Figure 9) while the positive output response is more pronounced compared to the real output response in the services sector (see Figure 9). Following a cut in government spending the real output of the tradable goods sector responds in a positive manner, which is qualitatively similar but less sizeable compared to its previous response (see Figures 12 and 8).

[Figures 10-11 about here]

---

<sup>15</sup> The tradable output (try) elasticity to taxes is set to  $\alpha_{\text{try}}=0.5$  and the market non-tradable output (mntry) elasticity of taxes to  $\alpha_{\text{mntry}}=0.4$ . The output elasticities of taxes for tradable goods and market-based services and construction remain unchanged, given that there are only marginal changes when excluding the public administration component from services.

[Figures 12-13 about here]

Overall, this analysis implies that a reduction in government spending exerts a negative response on aggregate output which reduces import demand, at the same time exports increase on account of competitiveness improvements contributing to a positive net export response profile. Although real output declines following a cut government spending, tradable or tradable-goods sectors respond positively to the downsizing in the government sector. This implies that more resources are freed for the private sector that are now directed to the more productive tradable sector further improving net export performance. Hence, downsizing the public sector induces a sectoral reallocation of resources in favour of the tradable sector, which will be associated with increased exports.

#### **4.2. Net Goods versus net services exports**

In this section we examine the behaviour of net goods exports and net services exports to a negative government purchases shock. Therefore we consider two additional SVAR specifications where we substitute each time total exports and imports with its goods and services sub-components. This discussion is warranted by the fact that exports of services constitute a quite significant part of Greek exports. Exports of services include tourism, shipping and transportation services, with the first two components driving export services performance.

Following a cut in government purchases goods' (services) exports improve for about 5-6 (2-3) quarter (see Figures 15/18) on account of competitiveness improvements, while the import of goods and services declines in a persistent manner (see Figures 16/19) in line with the reduction in domestic demand. Consequently, net goods (net services) exports improve considerably for about 7-8 (5-6) quarters after the initial shock and then return back to trend (Figures 14 and 17).<sup>16</sup>

[Figures 14-16 about here]

[Figures 17-19 about here]

---

<sup>16</sup> It should be noted that shipping services (that account for about 50% of the export of services) are primarily affected by international rather than domestic developments.

### 4.3. The effects of different expenditure components

Next we examine the effects of negative shocks on various government spending sub-components (as in Lane and Perotti, 2003) while focusing our attention on goods' exports. We look at government expenditure sub-components and emphasize on the behaviour of exports of goods in order to investigate the labour cost channel of fiscal policy argument of Lane and Perotti (1998) and Alesina et al (2002), which points out that the expansion in government spending, and in particular in the wage bill, increases wage pressure in the private sector raising labour costs and in turn worsens competitiveness and reduces exports.<sup>17</sup> We examine the following government spending sub-components: the government wage bill, non-wage government consumption (or intermediate consumption) and government investment. To this end we examine 3 different SVAR specifications, i.e., one for each individual spending component. In each case the government purchase variable is replaced by one of the above-mentioned spending components and enters before the net tax variable.<sup>18</sup> In addition, in order to control for possible correlation between the budgetary items we incorporate in the SVAR (after the net tax variable) the remaining government spending components (i.e., we consider a 7-variable SVAR). Hence, when the variable of interest is the government wage bill, the third variable in the SVAR is the sum of government investment and non-wage consumption; when the variable of interest is government investment, the third variable in the SVAR is government consumption (wage and non-wage components), while in the case of government non-wage consumption we add as third variable in the SVAR the sum of the government wage-bill and government investment.<sup>19</sup>

A cut in the government wage bill exerts a positive but short-lived response (lasting for about 3-4 quarters) on goods' exports (Figure 20). The positive goods' export response is in line with the labour cost channel of fiscal policy of Lane and Perotti (1998) and Alesina et al (2002). A cut in non-wage government consumption increases goods' exports for 1-2 quarters (Figure 21), while a reduction in government

---

<sup>17</sup> On the other hand, the export of services (shipping, tourism) could depend on other international factors (e.g. shipping services depend on global demand and trade and tourism services could be affected by political and economic developments in neighboring countries, i.e. political unrest in North African countries etc) rather than domestic government spending decisions.

<sup>18</sup> The government spending and revenue elasticity assumptions in (1) still hold in the case of the SVAR specifications examining the output and export of goods response to shocks in the government wage bill, government non-wage consumption and government investment.

<sup>19</sup> Keep in mind that in these specifications we subtract the current government transfers from current revenue; so we have already accounted for their possible correlation with each expenditure component.

investment induces a negative response of goods' export for about 2 quarter. Thereafter, the response turns positive (Figure 22).<sup>20</sup>

In line with the argument presented by Benetrix and Lane (2010), a reduction in government purchases and its subcomponents, reduces domestic aggregate demand, and can result in an increase in goods' exports if the relative size of the traded sector increases, implying that domestic firms switch to exporting as they face reduced demand from domestic customers.

[Figures 20-22 about here]

#### **4.4. The role of tax components**

This section examines the effect of an increase in several tax revenue components on net goods exports. In particular, we examine the following revenue components: direct household and business taxes, social security contributions and indirect taxes (VAT and other indirect taxes). Hence, we consider a separate SVAR specification for each variable of interest. In each case one of the above-mentioned individual revenue components enters in the SVAR after government purchases. Furthermore, in order to control for changes in other tax revenue variables we incorporate in the SVAR (as a third variable – i.e., we consider a 7 variable SVAR) the remaining tax revenue components. When the variable of interest is direct household (business) taxes, the third variable in the SVAR is net tax revenue minus direct household (business) taxes. Similarly, when the variable of interest is social security contributions (indirect taxes/VAT/other indirect taxes), the third variable in the SVAR is net taxes minus social security contributions (indirect taxes/VAT/other indirect taxes).<sup>21</sup>

A direct household tax hike reduces real output and consequently lowers demand for goods' imports (Figure 23), which in turn increases net goods exports (Figure 24). Goods' exports increase on impact but then decline persistently (Figure

---

<sup>20</sup> The reduction in each government spending component reduces output leading to a negative response of goods' imports.

<sup>21</sup> In the abovementioned SVAR specifications we set the output elasticity of direct household (business) taxes to 1.8 (1.08), the output elasticity of indirect tax (VAT/ other indirect tax) revenue to 1 and the output elasticity of social security contributions to 0.85 based on the elasticities estimated by Girouard and Andre (2005).



25). The positive response on impact could reflect exporters' strategy to redirect more resources abroad as domestic demand declines dramatically. Thereafter, the decline in imports lowers exports given that the import content of exports is about 30% (European Commission, 2012).

[Figures 23-25 about here]

A direct business tax hike is associated positively with the export of goods for about 4-5 quarter after the shock; thereafter exports turn negative and remain persistently below trend (Figure 26). On the other hand, imports of goods are not particularly affected in the first few quarters after the shock (the response is insignificant), but then decline significantly (Figure 28) driven by the negative response of real output. The net export to GDP ratio declines the first 8-9 quarters after the shock despite the increase in the exports of goods (Figure 27). This is explained by the fact that the sample average of the export of goods to GDP ratio is much smaller than the average of the imports of goods to GDP ratio (i.e., about 11% vis-à-vis 28% of GDP). Nine to ten quarters after the shock, the net export of goods improves in line with the reduction in the demand for imports. The initial temporary increase in the exports of goods seems at odds with what one might have expected (i.e., higher corporate taxes to lower exports). This could imply that following the fiscal consolidation and the tax hikes that reduce domestic demand, firms strive to sell their products abroad; however, the effect is short-lived. Keen and Syed (2006) examining 27 OECD member countries over the period 1967–2003 have reported analogous findings.

[Figures 26-28 about here]

In Figures 29-31 we present the response of the net export of goods to an increase in social security contributions. Goods' exports decrease the first few quarters after the shock (Figure 29) possibly because of higher labour costs (as pointed out by Alesina et al. (2002).<sup>22</sup> Goods imports decline on impact possibly

---

<sup>22</sup> Mooij and Keen (2012) report that a 'fiscal devaluation' which involves shifting from the raising of tax revenues from social security contributions to VAT as a way to mimic a nominal devaluation could improve the trade balance in the short run (by reducing the price of exports and increasing the price of imports), but the effects eventually disappear because the exchange rate and nominal wages adjust in the long run. Even if the exchange rate is fixed domestic wages will adjust, because workers (or their

because of the negative income effect coming from higher taxes; thereafter imports increase persistently because they are relatively cheaper from domestically produced goods (due to higher labour costs) (see Figure 31). Driven by the export and import responses, net goods' exports become negative after their positive impact response (Figure 30).

[Figures 29-31 about here]

Last but not least, an indirect tax hike induces a negative net goods export response, which turns positive after the 7<sup>th</sup> quarter (Figure 32). To better understand this finding we consider separately VAT and other indirect taxes (e.g., excise taxes). A tax hike in other indirect taxes worsens the trade balance for the first 6-7 quarters, while it improves it thereafter (Figure 33). Two things are at play here, first goods' exports decline (on account of increasing costs), second, goods' imports increase on impact (because they are perceived to be cheaper), while later they decline (overweighing the fall in exports) due to declining domestic demand.

By contrast, an increase in VAT is associated with a decline in net exports; a finding that is at odds with what one would expect (Figure 34). However, a similar finding has been recorded by Keen and Syed (2006). According to these authors, an increased reliance on VAT revenue tends to be associated with a sharp reduction in net exports that eventually fades. Keen and Syed (2006) attribute this to unrelated movements in consumption, and conclude that there is no trade effects of VAT changes in either the short or the long run. Nevertheless, another explanation that might be relevant in case of Greece relates to the significant delays in refunding VAT in export-related activities (see European Commission, 2013). This might not allow the proper identification of VAT related shocks through the SVAR methodology. Hence, this last finding on VAT should be taken with a pinch of salt both for the reasons discussed by Keen and Syed (2006) and for the above-mentioned data issues.<sup>23</sup>

---

unions), realizing that their real wage is reduced by the increased VAT rate, will push for nominal wage increases, moving the real producer wage back towards the pre-reform equilibrium (a process that any wage indexation, of course, would accelerate). Due to this wage adjustment fiscal devaluation will have no long-run impact on product or labour market outcomes.

<sup>23</sup> Following tax policy changes (and contrary to the case of government spending), there is no asymmetry in the output responses of tradable and non-tradable sectors. This implies that it is primarily the reduction in the size of the public sector that matters because it frees up resources for the private sector, which are then directed to the most productive uses.

[Figures 32-34 about here]

## 5. Conclusions

Driven by the fact that one of key goals of the EU-IMF Economic Adjustment Programme for Greece is the rebalancing of economic activity towards export-oriented activities, we investigate based on the SVAR methodology the effects that fiscal policy changes have on net exports and the sectoral composition of output in Greece in the post-2000 period.

Overall, what comes out of the analysis is that a cut in government purchases improves net export performance. Fiscal consolidation reduces real output, which in turn lowers the demand for imports improving net export performance. At the same time fiscal consolidation lowers labour costs improving cost competitiveness which, in turn, increases both exports and net exports. Negative shocks to individual government spending components exert a positive response of goods' exports, though this differs both in terms of size and timing profile. This implies, that it is not necessarily one particular government spending component that has to be reduced in order to induce a positive exports' response, but rather it is the whole downsizing of the public sector that matters.

Turning to tax policy changes we find that a direct household tax hike reduces real output and, consequently, the demand for goods' imports, improving the external balance. The same applies for direct business taxes, but external balances improve (due to falling imports) only in the outer years of the forecast horizon. On impact the evidence is not clear cut. Increases in social security contributions (that are associated with the labour tax wedge) and in other indirect taxes (e.g. excise taxes on energy that raise production costs) reduces net goods' exports.

Despite the fact that real aggregate output declines following a cut in government spending, tradable or tradable goods sectors respond positively to the downsizing in the public sector activities. This implies that more resources are freed for the private sector that are then directed to the more productive tradable sector further improving net export performance. Hence, a reduction in the size of the public sector can induce a reallocation of resources in favour of the tradable export oriented sector, resulting in increased exports.

This finding provides evidence in favour of an expenditure-based rather than a tax-based fiscal consolidation, because it contributes to the achievement of three policy goals. First, an improvement in the fiscal position; second, an improvement in the external balance; third, a sectoral reallocation from non-tradable to tradable that can lead to a sustainable improvement in export performance.

## References

Alesina A, Ardagna R, Perotti R, Schiantarelli F (2002) Fiscal policy, profits, and investment. *American Economic Review* 92: 571-89.

Auerbach A.J., Gorodnichenko, Y., 2012. Measuring the output responses to fiscal policy. *American economic Journal: Economic Policy* 4, 1-27.

Bank of Greece (2014) Annual Report for 2013, Athens, Greece.

Beetsma R, Giuliodori M (2011) The effects of government purchases shocks: review and estimates for the EU. *Economic Journal* 121: 4-32.

Beetsma R, Giuliodori M, Klaassen F (2008) The effects of public spending shock on trade balances and budget deficits in the European Union. *Journal of the European Economic Association*, 6(2-3):414-423.

Bénétrix A, Lane P (2010) Fiscal Shocks and the sectoral composition of output. *Open Economies Review* 21: 335-350.

Blanchard O, Perotti R (2002) An empirical characterization of the dynamic effects of government spending and taxes on output. *Quarterly Journal of Economics* 117: 1329-68

Brissimis SN, Hondroyiannis G, Papazoglou C, Tsaveas NT, Vasardani MA (2010) Current account determinants and external sustainability in periods of structural change. Bank of Greece, Working paper, No. 117.

Castro FD, Garrote D (2012) The effects of fiscal; shocks on the exchange rate in the EMU and the differences with the US. Banco de Espana, Documentos de Trabajo No1224.

Corsetti G, Meier A, Müller GJ (2012) What determines government spending multipliers? IMF, Working paper 12/150.

Corsetti G, Müller GJ (2008) Twin Deficits, Openness, and the Business Cycle. *Journal of the European Economic Association* 6: 404-413.

European Commission (2010) The Economic Adjustment Programme for Greece, Occasional Paper 61, May.

European Commission (2012) Quarterly Report on the Euro Area, No.2 European Commission, Brussels.

European Commission (2013) The Second Economic Adjustment Programme for Greece, 3<sup>rd</sup> Review, Occasional Paper 159, July.

European Commission (2014) Economic Forecasts, Winter 2014, European Commission, Brussels.

Eurostat (2008) NACE Rev. 2 Statistical classification of economic activities in the European Community, European Commission. Available at: [http://epp.eurostat.ec.europa.eu/cache/ITY\\_OFFPUB/KS-RA-07-015/EN/KS-RA-07-015-EN.PDF](http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-RA-07-015/EN/KS-RA-07-015-EN.PDF).

Eurostat (2013) News Release, Provision of deficit and debt data for 2012 – second notification, No 152/2013, 21 October 2012.

Eurostat (2014). Quarterly National Accounts, European Commission. Available at: [http://epp.eurostat.ec.europa.eu/portal/page/portal/national\\_accounts/data/database](http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/database).

Favero C, Giavazzi F., (2007) Debt and the effects of fiscal policy. NBER, Working Paper No 12822.

Gibson, H Malley, J., (2008) The Contribution of Sectoral Productivity Differentials to Inflation in Greece, *Open Economies Review*, vol. 19(5), pp. 629-650.

Girouard N, Andre C (2005) Measuring cyclically-adjusted budget balances for OECD countries. OECD Working Papers, No. 434.

IMF (2010) Greece: Staff report on request for a Stand-by Arrangement, IMF, Country Report No.10/110.

IMF (2013a) International Financial Statistics, IMF, Washington.

IMF (2013b) Greece: Fourth Review Under the Extended Arrangement Under the Extended Fund Facility, and Request for Waivers of Applicability and Modification of Performance Criterion- Staff Report, July, IMF Country Report No 13/241.

IMF(2014) Statement by the European Commission, the ECB and the IMF on Greece, Press Release No. 14/112, March 19, 2014.

Available at: <http://www.imf.org/external/np/sec/pr/2014/pr14112.htm>

Keen M, Syed M (2006) Domestic taxes and international trade, IMF Working paper, No. 06/47.

Kim S, Roubini N (2008). Twin deficit or twin divergence? Fiscal policy, current account, and real exchange rate in the U.S. *Journal of International Economics* 74: 362-383.

Lane P, Perotti R (1998) The trade balance and fiscal policy in the OECD. *European Economic Review* 42: 887-95.

Lane P, Perotti R (2003) The importance of composition of fiscal policy: evidence from exchange rate regimes. *Journal of Public Economics* 87: 2253-79.

Monacelli T, Roberto P (2008) Openness and the Sectoral Effects of Fiscal Policy. *Journal of the European Economic Association* 6: 395-403.

Monokroussos P, Thomakos DD (2012) Can Greece be saved? Current account, fiscal imbalances and competitiveness, London School of Economics, Hellenic Observatory on Greece and Southeast Europe, GreeSE paper no.59.

Mooij RD, Keen M (2012) Fiscal devaluation and fiscal consolidation: The VAT in troubled times, IMF Working paper, No12/85.

OECD (2013a) Economic Surveys: Greece. November, OECD, Paris.

OECD (2013b) Economic Outlook, No 94.OECD, Paris.

Ravn MO, Schmitt-Grohé S, Uribe M (2007) Explaining the Effects of Government Spending Shocks on Consumption and the Real Exchange Rate, NBER Working Papers 13328.

Tagkalakis, A., 2008. The effects of fiscal policy on consumption in recessions and expansions. *Journal of Public Economics* 92, 1486-1508.

Tagkalakis, A (2013) The unemployment effects of fiscal policy: recent evidence from Greece, *IZA Journal of European Labor Studies*, vol. 2(1), pp 1-32.

Figure 1: The response of net export to GDP to a cut in government purchases

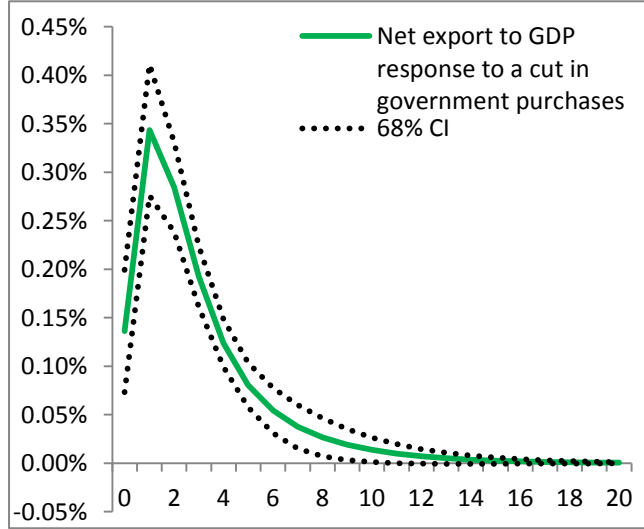


Figure 2: The response of ULC and CPI based REER to a cut in government purchases

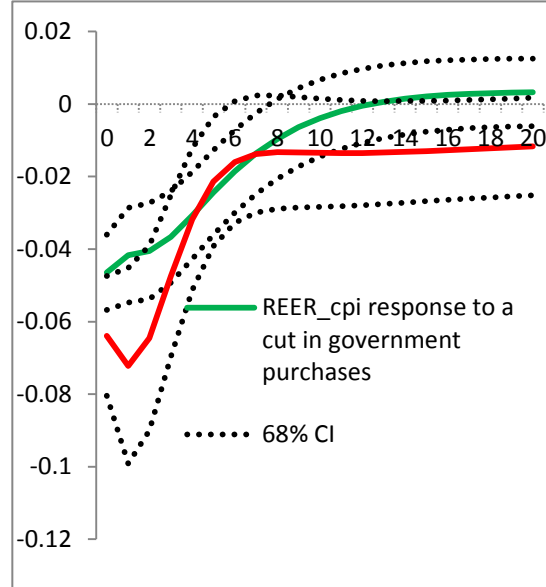
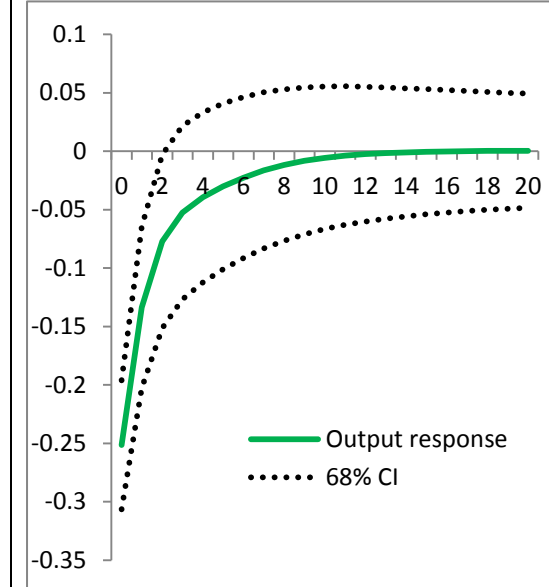


Figure 3: The output response to a cut in government purchases



Notes: The solid green (red) line represents the response of the variable of interest to a 1 p.p. of GDP government purchases shock. The black round dot lines are 68% confidence intervals, which have been calculated by bootstrapping the residuals (1000 bootstrap replications were performed). The vertical axis is in % of GDP in Figure 1, in % changes in Figure 2 and in p.p. of GDP in Figure 3.



Figure 4: The response of export to a cut in government purchases

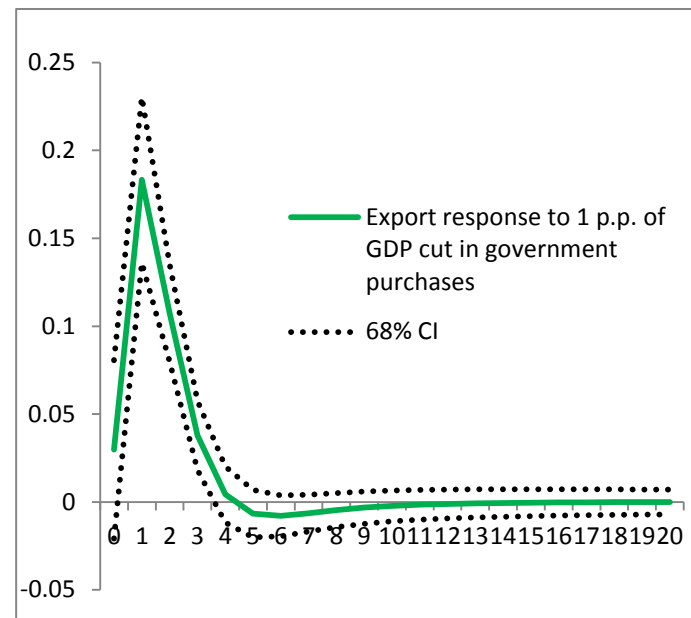
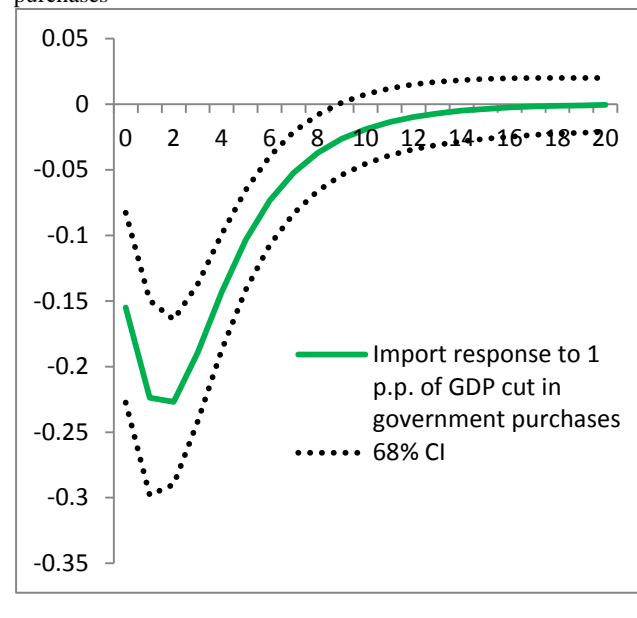


Figure 5: The response of import to a cut in government purchases



Notes: The solid green line represents the response of the variable of interest to a 1 p.p. of GDP government purchases shock. The black round dot lines are 68% confidence intervals, which have been calculated by bootstrapping the residuals (1000 bootstrap replications were performed). The vertical axis is in p.p. of GDP in Figures 4/5.

Figure 6: The response of non-tradable sector output to a cut in government purchases

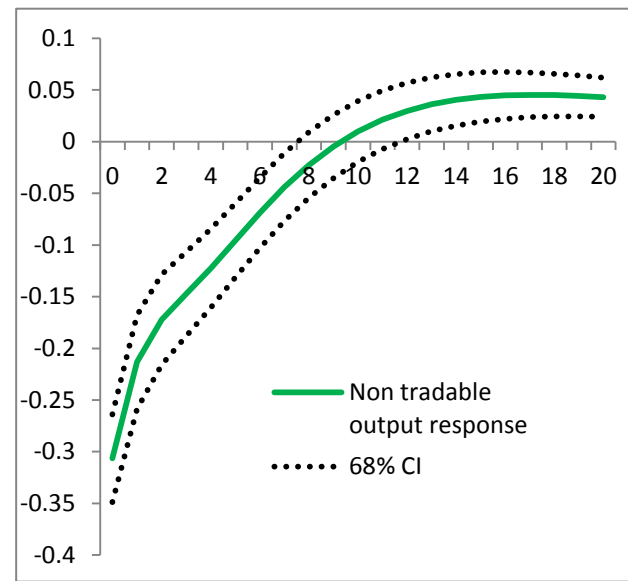
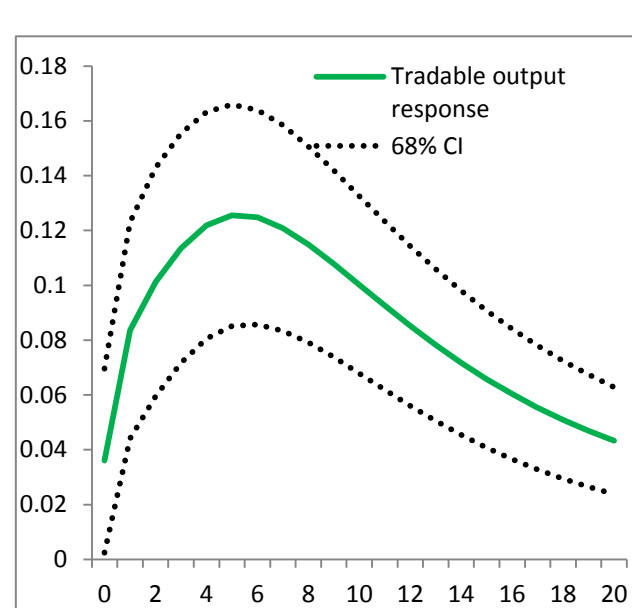


Figure 7: The response of tradable sector output to a cut in government purchases



Notes: The solid green line represents the response of the variable of interest to a 1 p.p. of GDP government purchases shock. The black round dot lines are 68% confidence intervals, which have been calculated by bootstrapping the residuals (1000 bootstrap replications were performed). The vertical axis is in p.p. of GDP in Figures 6/7.

Figure 8: The response of tradable-goods sector output to a cut in government purchases

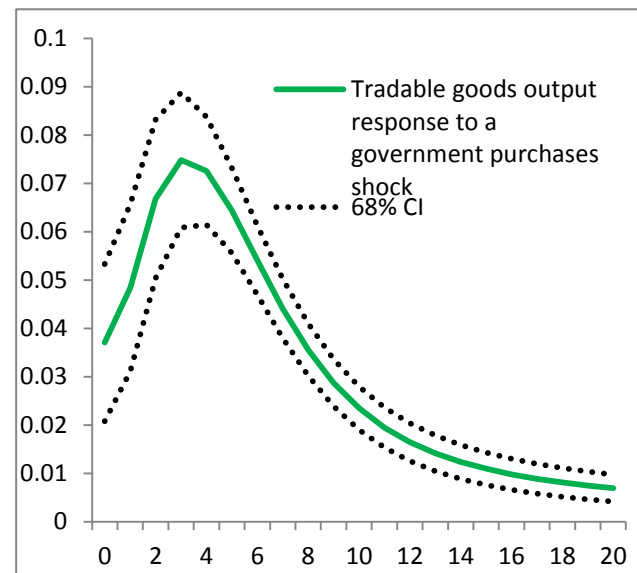
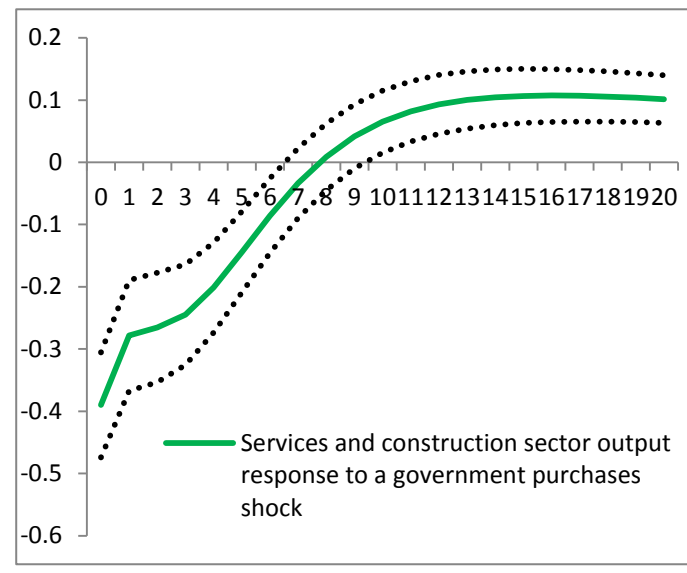


Figure 9: The response of services and construction sector output to a cut in government purchases



Notes: The solid green line represents the response of the variable of interest to a 1 p.p. of GDP government purchases shock. The black round dot lines are 68% confidence intervals, which have been calculated by bootstrapping the residuals (1000 bootstrap replications were performed). The vertical axis is in p.p. of GDP in Figures 8/9.

Figure 10: The response of tradable sector output to a cut in government purchases

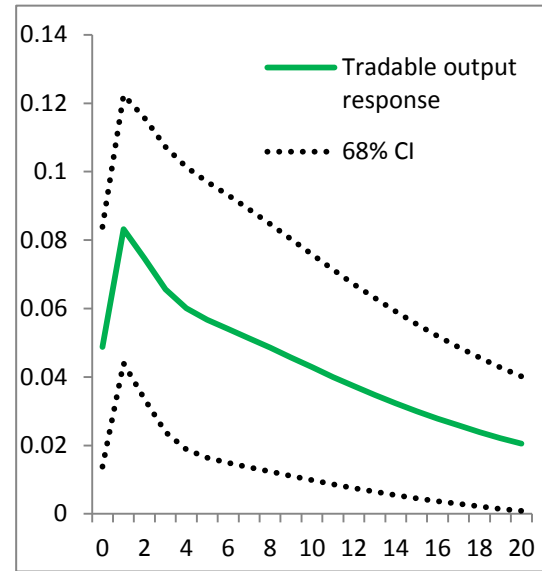
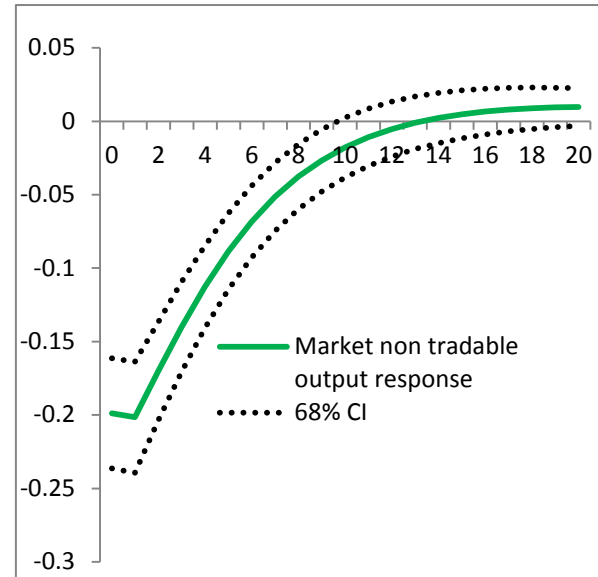


Figure 11: The response of market- non-tradable sector output to a cut in government purchases



Notes: The solid green line represents the response of the variable of interest to a 1 p.p. of GDP government purchases shock. The black round dot lines are 68% confidence intervals, which have been calculated by bootstrapping the residuals (1000 bootstrap replications were performed). The vertical axis is in p.p. of GDP in Figures 10/11.

Figure 12: The response of tradable-goods sector output to a cut in government purchases

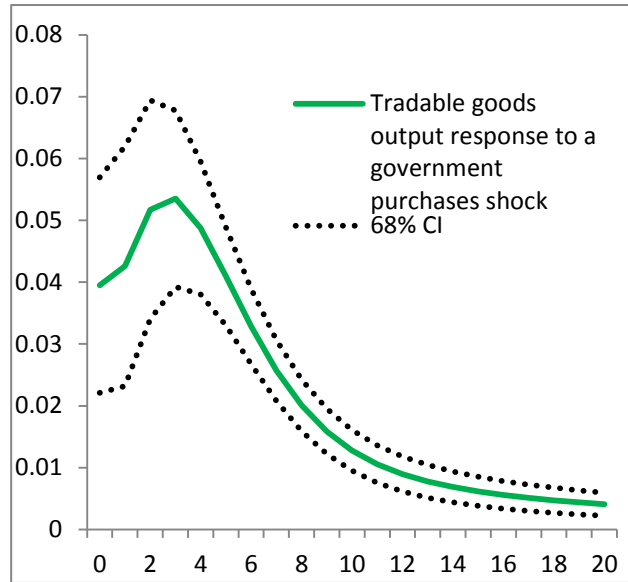
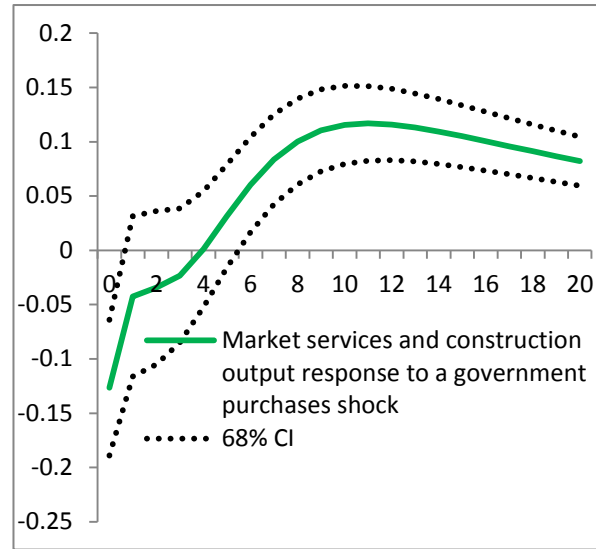


Figure 13: The response of market-services and construction sector output to a cut in government purchases



Notes: The solid green line represents the response of the variable of interest to a 1 p.p. of GDP government purchases shock. The black round dot lines are 68% confidence intervals, which have been calculated by bootstrapping the residuals (1000 bootstrap replications were performed). The vertical axis is in p.p. of GDP in Figure 12/13.

Figure 14: The response of net goods export to a cut in government purchases

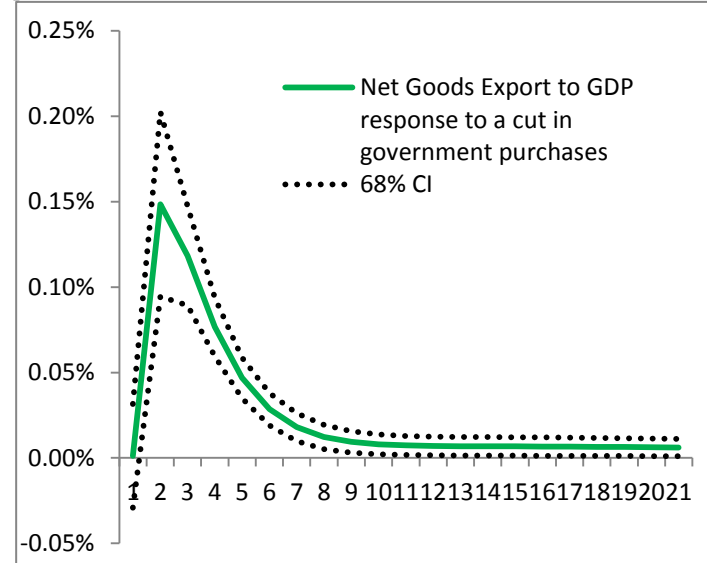


Figure 15: The response of goods export to a cut in government purchases

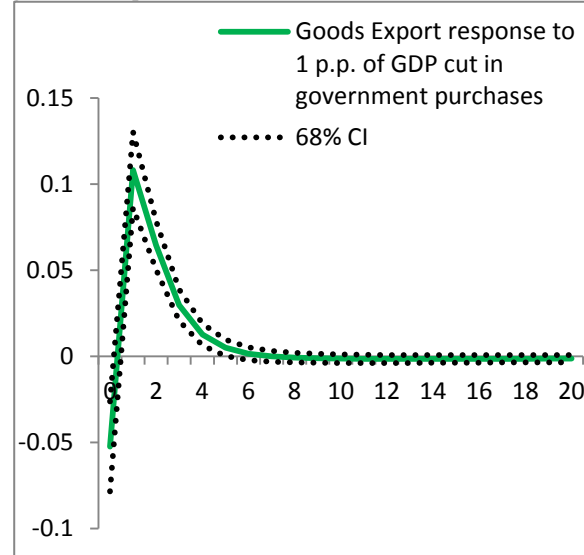
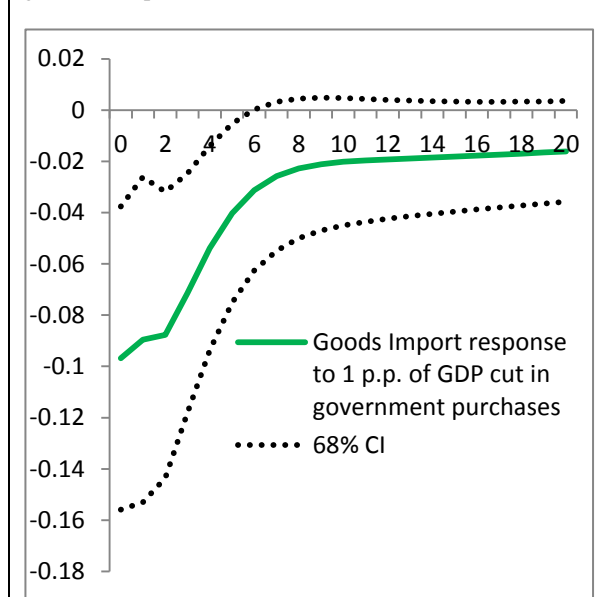


Figure 16: The response of goods import to a cut in government purchases



Notes: The solid green line represents the response of the variable of interest to a 1 p.p. of GDP government purchases shock. The black round dot lines are 68% confidence intervals, which have been calculated by bootstrapping the residuals (1000 bootstrap replications were performed). The vertical axis is in % of GDP in Figure 14 and in p.p. of GDP in Figure 15/16.

Figure 17: The response of net services export to a cut in government purchases

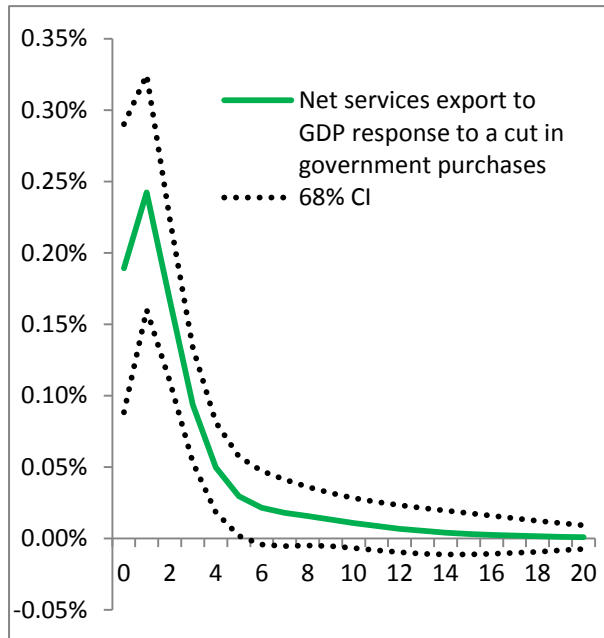


Figure 18: The response of services export to a cut in government purchases

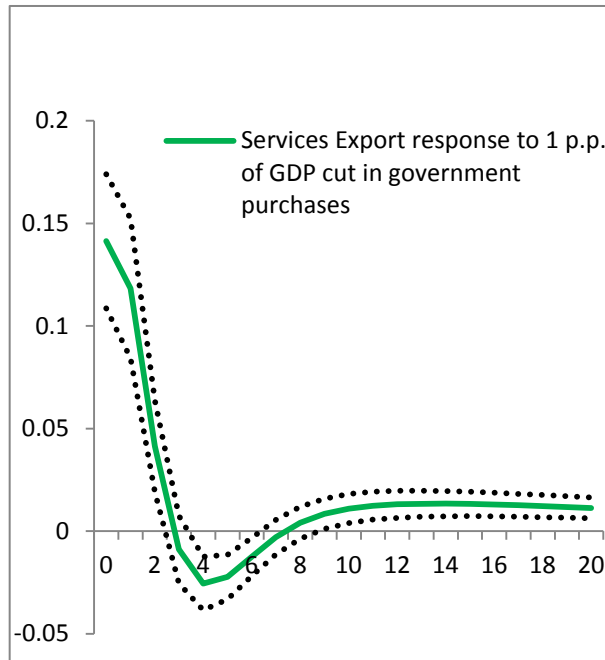
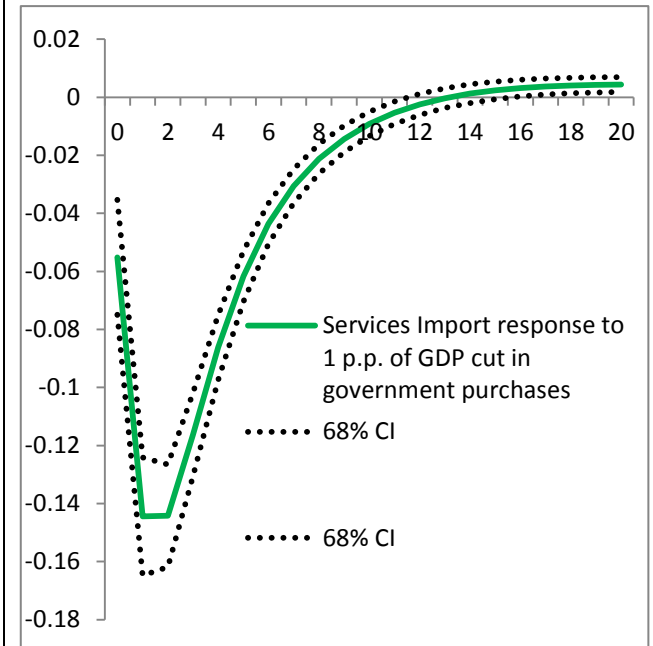


Figure 19 : The response of services import to a cut in government purchases



Notes: The solid green line represents the response of the variable of interest to a 1 p.p. of GDP government purchases shock. The black round dot lines are 68% confidence intervals, which have been calculated by bootstrapping the residuals (1000 bootstrap replications were performed). The vertical axis is in % of GDP in Figure 17 and in p.p. of GDP in Figures 18/19.

Figure 20: The response of goods export to a cut in government wage bill

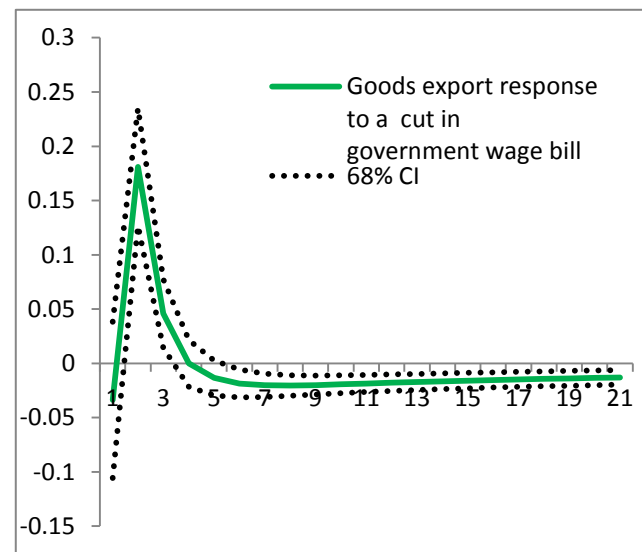


Figure 21: The response of goods export to a cut in non-wage government consumption

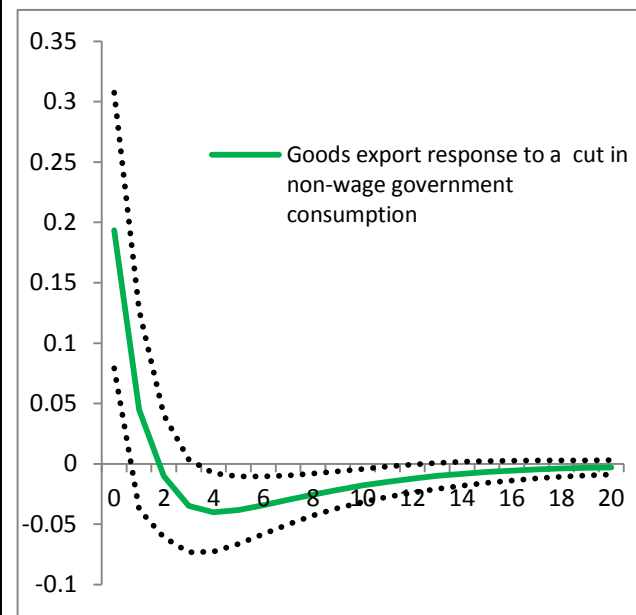
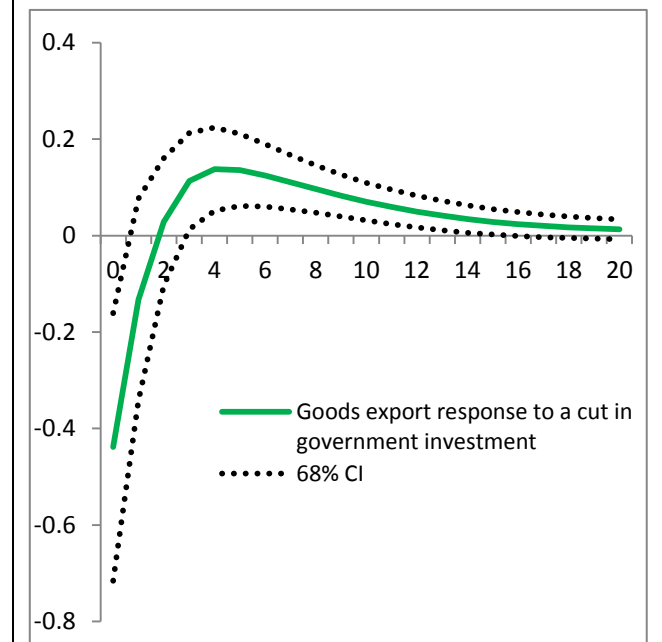


Figure 22 The response of goods export to a cut in government investment



Notes: The solid green line represents the response of the variable of interest to a 1 p.p. of GDP government wage-bill/ non wage government consumption/government investment shock. The black round dot lines are 68% confidence intervals, which have been calculated by bootstrapping the residuals (1000 bootstrap replications were performed). The vertical axis is p.p. of GDP in Figures 20/21/22.



Figure 23: The response of the imports of goods to an increase in direct household taxes (DHT)

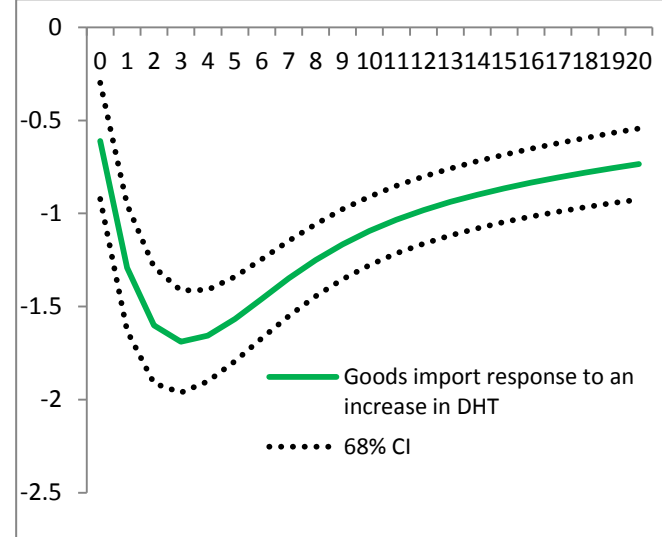


Figure 24: The response of net exports to an increase in direct household taxes (DHT).

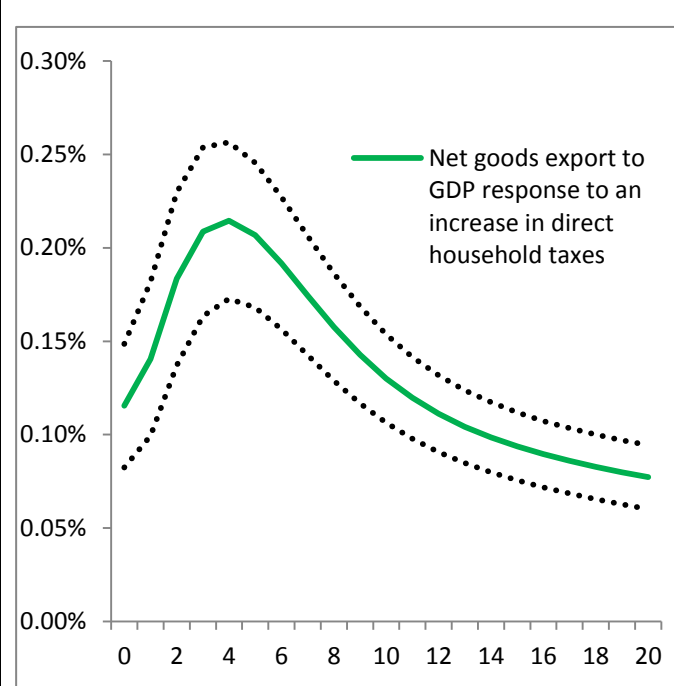
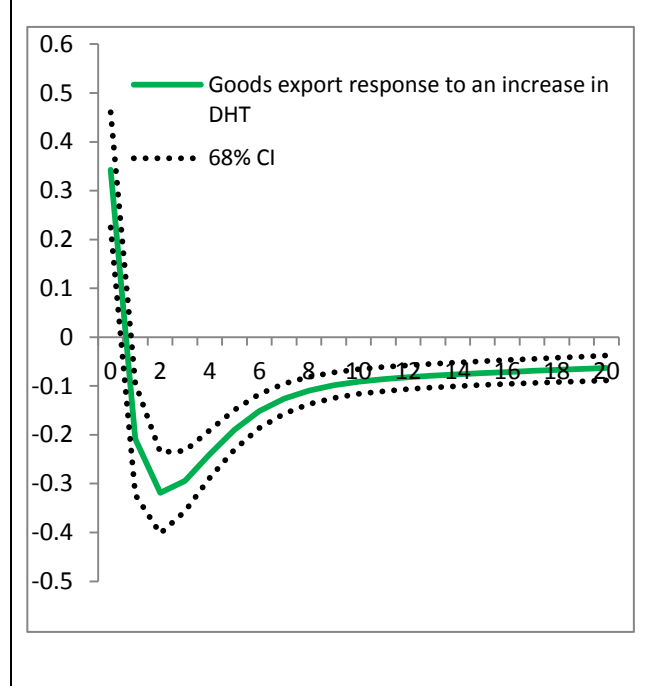


Figure 25 The response of goods exports to an increase in direct household taxes (DHT)



Notes: The solid green (red) line represents the response of the variable of interest to a 1 p.p. of GDP direct household tax shock. The black round dot lines are 68% confidence intervals, which have been calculated by bootstrapping the residuals (1000 bootstrap replications were performed). The vertical axis is in % of GDP in Figure 24 and in p.p. of GDP in Figures 23/25.

Figure 26: The response of the exports of goods to an increase in direct business taxes (DBT)

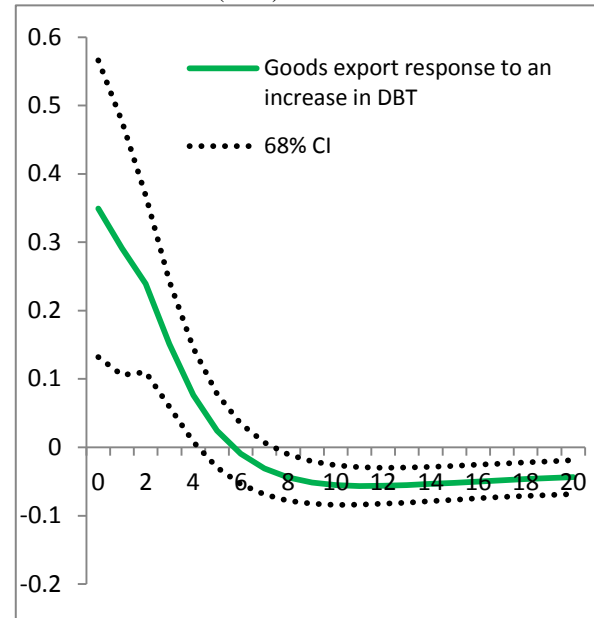


Figure 27: The response of net exports to an increase in direct business taxes (DBT).

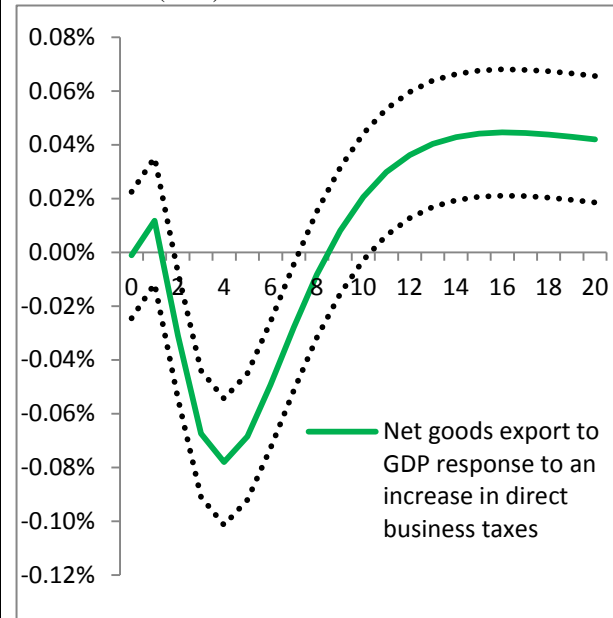
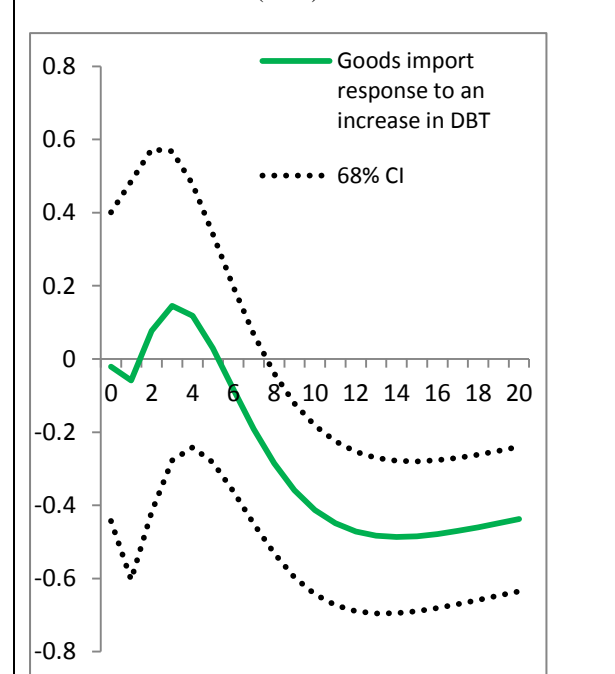


Figure 28: The response of goods imports to an increase in direct business taxes (DBT)



Notes: The solid green (red) line represents the response of the variable of interest to a 1 p.p. of GDP direct business tax shock. The black round dot lines are 68% confidence intervals, which have been calculated by bootstrapping the residuals (1000 bootstrap replications were performed). The vertical axis is in % of GDP in Figure 27 and in p.p. of GDP in Figures 26/28.

Figure 29: The response of the exports of goods to an increase in social security contributions (SSC)

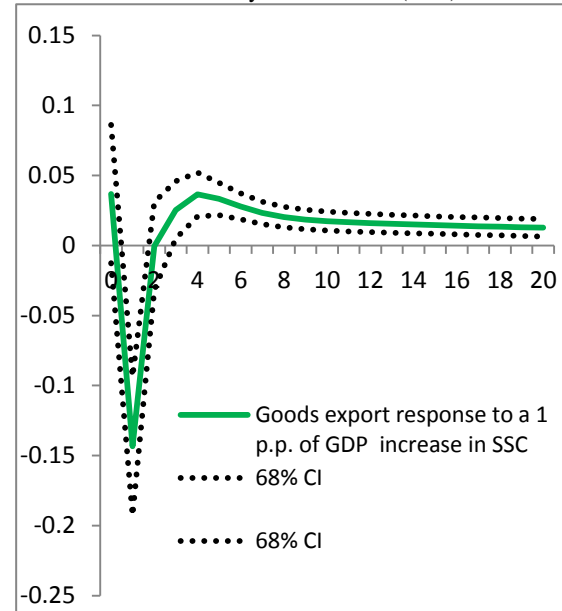


Figure 30: The response of net exports to an increase in social security contributions (SSC)

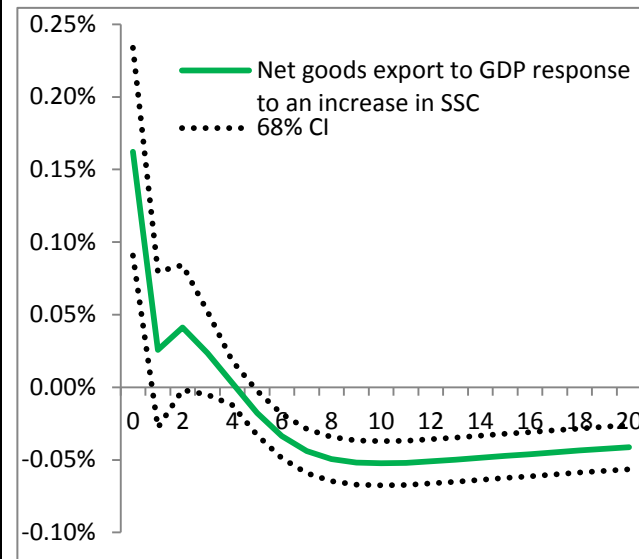
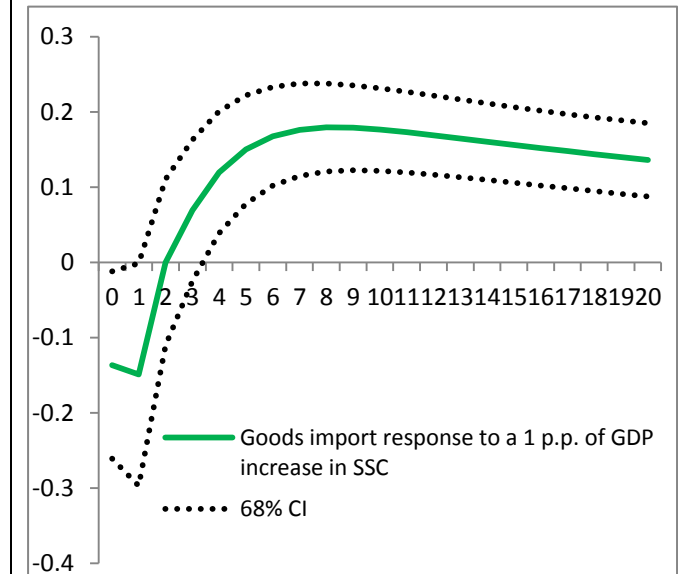


Figure 31: The response of goods imports to an increase in social security contributions (SSC)



Notes: The solid green (red) line represents the response of the variable of interest to a 1 p.p. of GDP social security contributions shock. The black round dot lines are 68% confidence intervals, which have been calculated by bootstrapping the residuals (1000 bootstrap replications were performed). The vertical axis is in % of GDP in Figure 30 and in p.p. of GDP in Figures 29/31.

Figure 32: The response of the net exports of goods to an increase in indirect taxes

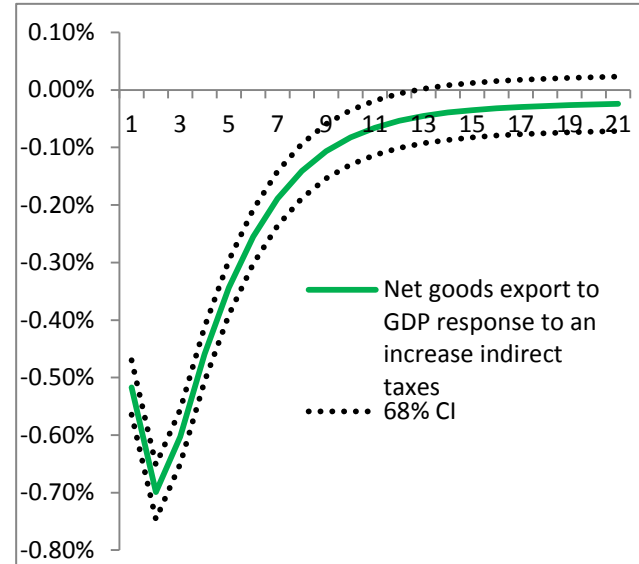


Figure 33: The response of the net exports of goods to an increase in other indirect taxes

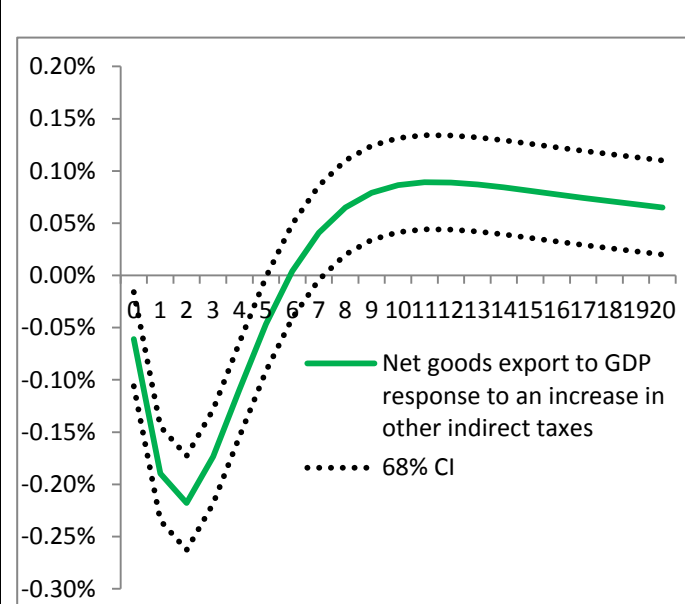
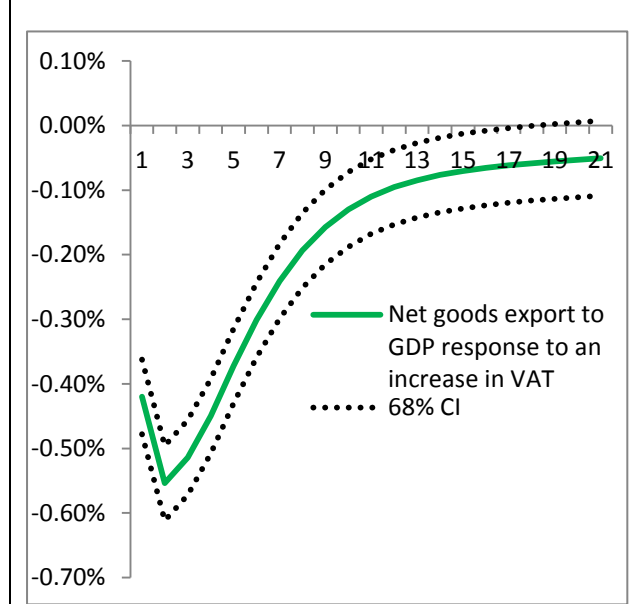


Figure 34: The response of the net exports of goods to an increase in VAT



Notes: The solid green (red) line represents the response of the variable of interest to a 1 p.p. of GDP indirect/other indirect/VAT tax shock. The black round dot lines are 68% confidence intervals, which have been calculated by bootstrapping the residuals (1000 bootstrap replications were performed). The vertical axis is in % of GDP in Figures 32-34.



## BANK OF GREECE WORKING PAPERS

171. Tagkalakis, O. A., “Assessing the Variability of Indirect Tax Elasticity in Greece”, January 2014.
172. Koukouritakis, M., A.P. Papadopoulos and A.Yannopoulos, “Transmission Effects In The Presence of Structural Breaks: Evidence from South-Eastern European Countries”, January 2014.
173. Du Caju, P., T. Kosma, M. Lawless, J. Messina, T. Rõdm, Why Firms Avoid Cutting Wages: Survey Evidence From European Firms”, January 2014.
174. Mitrakos, T., “Inequality, Poverty and Social Welfare in Greece: Distributional Effects of Austerity”, February 2014.
175. Lazaretou, S., “Η Έξυπνη Οικονομία: «Πολιτιστικές» και «Δημιουργικές» Βιομηχανίες Στην Ελλάδα Μπορούν Να Αποτελέσουν Προοπτική Εξόδου Από Την Κρίση”, February 2014.
176. Chouliarakis, G., and S. Lazaretou, “Déjà Vu? The Greek Crisis Experience, the 2010s Versus the 1930s. Lessons From History”, February 2014.
177. Tavlas, G.S., “In Old Chicago: Simons, Friedman and The Development of Monetary-Policy Rules”, March 2014.
178. Bardakas, C. I., “Financing Exports of Goods: a Constraint on Greek Economic Growth, March 2014.
179. Tagkalakis, O.A., “Financial Stability Indicators and Public Debt Developments”, May 2014.
180. Kaplanoglou, G., V. T., Rapanos , and I.C, Bardakas, “Does Fairness Matter for the Success of Fiscal Consolidation?”, May 2014.
181. Tagkalakis, O. A., “The Determinants of VAT Revenue Efficiency: Recent Evidence from Greece”, May 2014.
182. Papageorgiou, D., “BoGGEM: A Dynamic Stochastic General Equilibrium Model for Policy Simulations”, May 2014.
183. Tsionas, E.G., “On Modeling Banking Risk”, May 2014.
184. Louzis, P.D., “Macroeconomic and credit forecasts in a small economy during crisis: a large Bayesian VAR approach”, June 2014.
185. Adam, A., and T., Moutos, “Industry-Level Labour Demand Elasticities Across the Eurozone: Will There Be Any Gain After the Pain of Internal Devaluation?” July, 2014.