



ISSN 2443-8030 (online)

Public Investment Stimulus in Surplus Countries and their Euro Area Spillovers

Jan in 't Veld

ECONOMIC BRIEF 016 | AUGUST 2016

EUROPEAN ECONOMY

*Economic and
Financial Affairs*

European Economy Economic Briefs are written by the staff of the European Commission's Directorate-General for Economic and Financial Affairs to inform discussion on economic policy and to stimulate debate.

The views expressed in this document are solely those of the author(s) and do not necessarily represent the official views of the European Commission.

Authorised for publication by Marco Buti, Director-General for Economic and Financial Affairs.

LEGAL NOTICE

Neither the European Commission nor any person acting on its behalf may be held responsible for the use which may be made of the information contained in this publication, or for any errors which, despite careful preparation and checking, may appear.

This paper exists in English only and can be downloaded from http://ec.europa.eu/economy_finance/publications/.

***Europe Direct is a service to help you find answers
to your questions about the European Union.***

**Freephone number (*):
00 800 6 7 8 9 10 11**

(* The information given is free, as are most calls (though some operators, phone boxes or hotels may charge you).

More information on the European Union is available on <http://europa.eu>.

Luxembourg: Publications Office of the European Union, 2016

KC-BE-16-016-EN-N (online)
ISBN 978-92-79-54485-9 (online)
doi:10.2765/413616 (online)

KC-BE-16-016-EN-C (print)
ISBN 978-92-79-54484-2 (print)
doi:10.2765/86462 (print)

© European Union, 2016

Reproduction is authorised provided the source is acknowledged.

European Commission

Directorate-General for Economic and Financial Affairs

Public Investment Stimulus in Surplus Countries and their Euro Area Spillovers

By Jan in 't Veld

Summary

This note describes model simulations that broadly confirm the view that at the current juncture, with monetary policy constrained by the zero interest rate floor, a debt-financed increase in government investment in surplus countries will have positive GDP spillovers to the rest of the euro area. If monetary policy cannot be accommodating, GDP spillovers may be small, but when policy rates are held constant for two years, spillovers can be significant. An increase in (productive) spending in Germany and the Netherlands can boost GDP in these countries and also have significant positive spillovers on the rest of EA GDP, while the effects on current accounts are likely to be small. Effects can be even larger when investment is directed to the most productive projects. With low borrowing cost at present, the increase in government debt for surplus countries will be modest, while there could be an improvement in debt ratios in the rest of the euro area.

Contact: Jan in 't Veld, European Commission, Directorate General for Economic and Financial Affairs, Models and databases, jan.intveld@ec.europa.eu.

Introduction

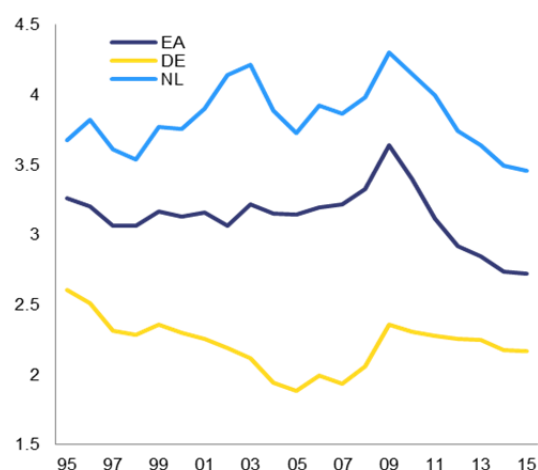
In discussions on the appropriate economic policy of the euro area, the impact of government investment on GDP, its spillovers across other euro area countries and its impact on current account imbalances are much debated issues. Would an increase in government investment in countries with persistent and large current account surpluses also have positive spillover effects on other euro area countries? And could such a stimulus help to reduce these large persistent current account surpluses? In the European context it is essential to achieve an appropriate fiscal stance at the level of the euro area as a whole, and the Council's euro area recommendations call for a differentiation of the fiscal effort by individual Member States taking into account spillovers across euro area countries. The country specific recommendations for Germany call specifically for "a sustained upward trend in public investment, especially in infrastructure, education, research and innovation". The latter is also mentioned as a priority for the Netherlands. This note analyses the domestic and spillover effects of public investment with QUEST model simulations. For technical reasons related to model size the focus is on Germany and the Netherlands, but the analysis could be extended to other surplus countries and conclusions would generally hold.

Public investment has been on a declining trend in both Germany and the Netherlands since 2009. In Germany the public investment share in GDP has been below the EA average since 1995, and it has fallen from 2.4 in 2009 to 2.1 in 2015 (see Graph 1). While the public investment share in the Netherlands is higher than the EA average, it has been reduced from 4.3 in 2009 to 3.4 in 2015. As both countries have debt-to-GDP ratios well below the EA average, and can benefit from record low interest rates at the moment, a case can be made for an increase in public investment. Both countries have also large current account surpluses and the question is how such an increase in government investment would impact on these surpluses. This note examines the domestic and spillover effects of such an investment stimulus in the QUEST model. It is found that it can boost domestic demand in these surplus countries and help to reduce their current account surpluses, and have positive GDP spillover effects on other EA member states, but the impact on other EA member states' current accounts is shown to be small.

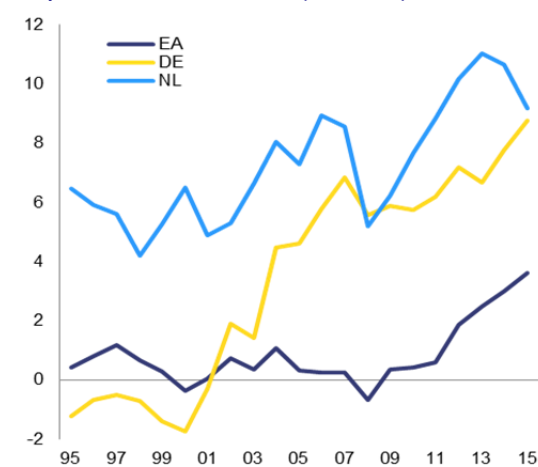
The following section starts with a brief, non-exhaustive overview of other model simulations of

an increase in public investment in Germany. All these studies show positive output effects and non-negligible spillovers. Section 3 then describes model simulations with the QUEST model under alternative assumptions. The simulations are for a 1% of GDP increase in public investment, jointly in Germany and the Netherlands together. When monetary policy is not accommodating, the spillover effects are negligible, but when monetary policy does not respond to the stimulus in the first two years, the GDP spillovers are sizeable. Effects can be even larger when investment is directed to the most productive projects and when low borrowing cost for Germany and the Netherlands are taken into account, the increase in government debt for surplus countries will be relatively modest, while there could be an improvement in debt ratios in the rest of the euro area.

Graph 1.a: Government investment (% of GDP)



Graph 1.b: Current account (% of GDP)



Source: Ameco

2. Overview of other existing studies

This section first briefly reviews some other studies of increased public investment in Germany. The summary is selective and non-exhaustive, and focusses on model-based analyses. All these studies show higher public investment raises GDP, and also that spillovers to other EA Member States can be non-negligible.

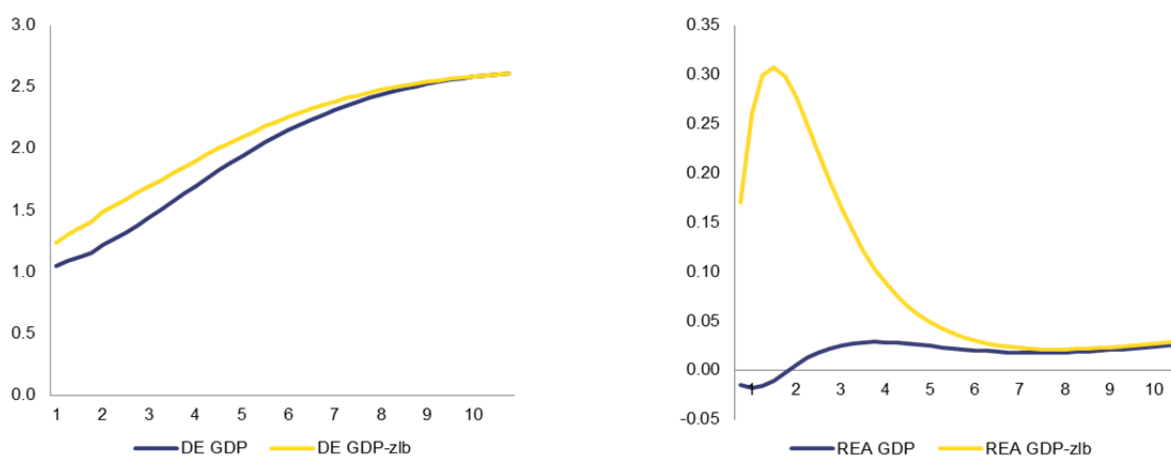
In 't Veld (2013) assesses the costs of simultaneous consolidations in periphery and core countries in the 2011-13 period and finds spillovers from consolidations in core countries worsened the economic situation in the periphery. A temporary increase in public investment in both Germany and the rest of core EA (an aggregate of The Netherlands, Belgium, Austria, Finland and the Baltics) raises GDP by between 0.8 and 1 in these countries when interest rates are held constant under the zero lower bound. This boost imports from other EA trading partners and raises GDP in these countries by between 0.2-0.3%. It also leads to some rebalancing. Current account surpluses are reduced by between 0.3-0.4 pps., but the improvement in current accounts in the periphery is relatively modest, at most 0.1 pp.

Using a multi-region version of GIMF, Elekdag and Muir (2014) look at the effects of a two year boost to government investment in Germany of 1% of GDP. They show the importance of the monetary policy channel. Under normal conditions there can be negative spillovers, as the monetary stance will tighten given higher inflation rates, leading to higher real interest rates across the monetary union. This will depress domestic demand and will also be

associated with an appreciation, thereby depressing EA exports (ibid., p. 15). However, at the zero lower bound with constant policy rates, higher inflation rates are characterised by lower real interest rates, boosting domestic demand in Germany and the rest of the EA, and leading to a depreciation, further increasing net exports. Under an accommodative monetary policy, when the ECB does not react with a monetary tightening, increased public investment has sizeable positive spillovers to the rest of the Euro Area of between 0.2 and 0.3%. The current account of Germany deteriorates by 0.55 pp, while those in the rest of the EA improve by between 0.05 and 0.1 pps.

Kollmann, Ratto, Roeger, in 't Veld, and Vogel (2015) estimate a three-country DSGE model to analyse the drivers of Germany's current account surplus. They conclude the surplus reflects a succession of distinct shocks, the most important being positive shocks to German saving rate and to rest of the world' demand for German exports, as well as labour market reforms and other positive German aggregate supply shocks. They link the savings shock to increased awareness about future demographic developments and pension generosity. The response to a positive shock to government investment of 1% of GDP in this model is an increase in German GDP, but a small initial decline in GDP in the rest of the euro area as higher interest rates reduce domestic demand in these countries. Crucially, this finding of negative GDP spillovers hinges on the monetary policy response. When monetary policy is constrained by the zero lower bound, and interest rates are not raised, the GDP spillover is positive and output rises in the rest of the euro area already on impact (see Graph 2).¹

Graph 2: Government investment shock in Kollmann et al. model (2015)



Note: Impulse responses of GDP to a 1% of GDP increase in government investment. The dark line is the scenario with normal monetary policy reaction, as published in Kollmann et al. (2015), the yellow line is the response when interest rates are kept unchanged for two years.

The German Ministry of Economic Affairs examines spillovers of increased government investment using Oxford Economics' Global Econometric Model (Bundesministerium für Wirtschaft und Energie, 2015). In the benchmark scenario, monetary policy reacts to the three year fiscal stimulus, and public investment is assumed to be non-productive, and as a result German GDP increases by only 0.6% in the first year, gradually receding in following years, and GDP spillovers to the rest of the EA are only slightly positive in the first year (0.08) and negative in following years. When monetary policy is accommodating, and when public investment is assumed to be productive, German GDP increases by 1% in the first year, and spillovers are positive throughout, around 0.12, while the current account in the rest of the EA improves by 0.1 pps.

In a recent report, Deutsche Bundesbank (2016) show that in model simulations with the NiGEM model, the monetary policy assumption also plays a crucial role. With a normal interest rate response, GDP spillovers are smaller than when interest rates are kept constant for two years. With constant interest rates in NiGEM, a two year increase in public investment of 1% of GDP raises GDP in Germany by 0.5%, while euro area spillovers are between 0.1-0.3%. One specific point that is made in this box is that the results depend on the assumed import share. It could be argued that for government consumption, which is typically largely the public sector wage bill, the specific import share is smaller than the average import share of domestic demand assumed in the NiGEM model. That would reduce the 'import leakage' of the stimulus through government consumption, i.e. raise the domestic GDP effects but lower the spillovers.²

All in all, these studies point to the same conclusion, that at the current juncture, with policy rates constrained at their zero floor, positive GDP spillovers can be sizeable.³

3. Joint public investment stimulus in Germany and the Netherlands

This section updates earlier QUEST model simulations and shows stylised scenarios of an increase in public investment in Germany and the Netherlands under different assumptions. The scenarios are purely illustrative, and normalised to an increase of 1% of baseline GDP, lasting for 10 years, and then gradually returning back to baseline. The model consists of five Euro area member states,

Germany, France, Italy, Spain and the Netherlands, as well as one block for the rest of the EA.

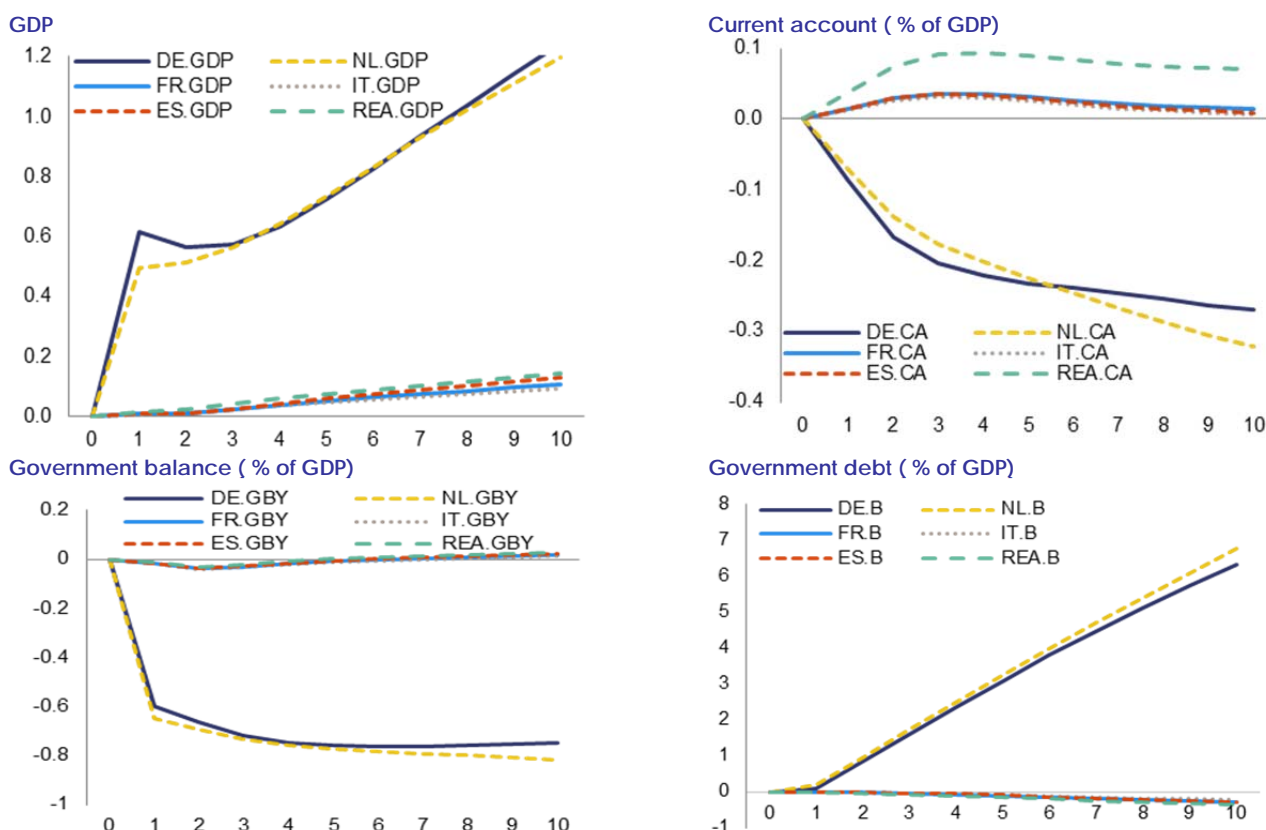
Four scenarios are considered. First, a pre-crisis situation in which monetary policy is not constrained and reacts to the increase in spending by raising the policy rate in line with a standard Taylor rule. Second, the current situation with monetary policy constrained by the zero lower bound, and where the stimulus can be accommodated by the ECB. In the third scenario the assumed productivity of public capital is raised to illustrate the positive effects in case of higher efficiency of spending. The fourth and final scenario takes additionally into account the lower borrowing costs that the surplus countries now face.

3.1 No monetary accommodation

In the first scenario, monetary policy responds to the increase in public investment by raising interest rates. This corresponds to the situation before the crisis when monetary policy was not constrained by the zero lower bound. When interest rates are raised in line with a standard Taylor rule, nominal rates increase by more than inflation, and the corresponding increase in real interest rates depresses domestic demand. The impact multiplier is lower, 0.6 for Germany, 0.5 for the Netherlands, also because both are open economies with high import leakage. But GDP effects are increasing over time as public investment is productivity enhancing, and GDP is about 1.2% higher after 10 years (Graph 3). The deterioration in the government balance is initially around 0.6 pps. as automatic stabilisers reduce the impact on the government balance, but the deficit gradually increases as interest payments rise. Government debt increases gradually and is around 6 pps. higher after a decade.⁴ The current account surpluses of Germany and the Netherlands fall by 0.2-0.3 pps..

The rest of the euro area benefits from the public investment stimulus in Germany and the Netherlands through higher exports, but this is partly offset by the negative impact of higher real interest rates on domestic demand. In addition, the fiscal stimulus is associated with an appreciation of the euro and this reduces the boost to net exports in the rest of the euro area. All in all, in the first years the interest rate effect on domestic demand and the appreciation of the euro offset the direct trade demand effect and the GDP spillovers to the rest of the EA are close to zero. In later years they gradually become positive.

Graph 3: Investment stimulus in surplus countries with no monetary accommodation



Note: Increase in public investment in DE and NL of 1% of GDP, under normal monetary policy rule

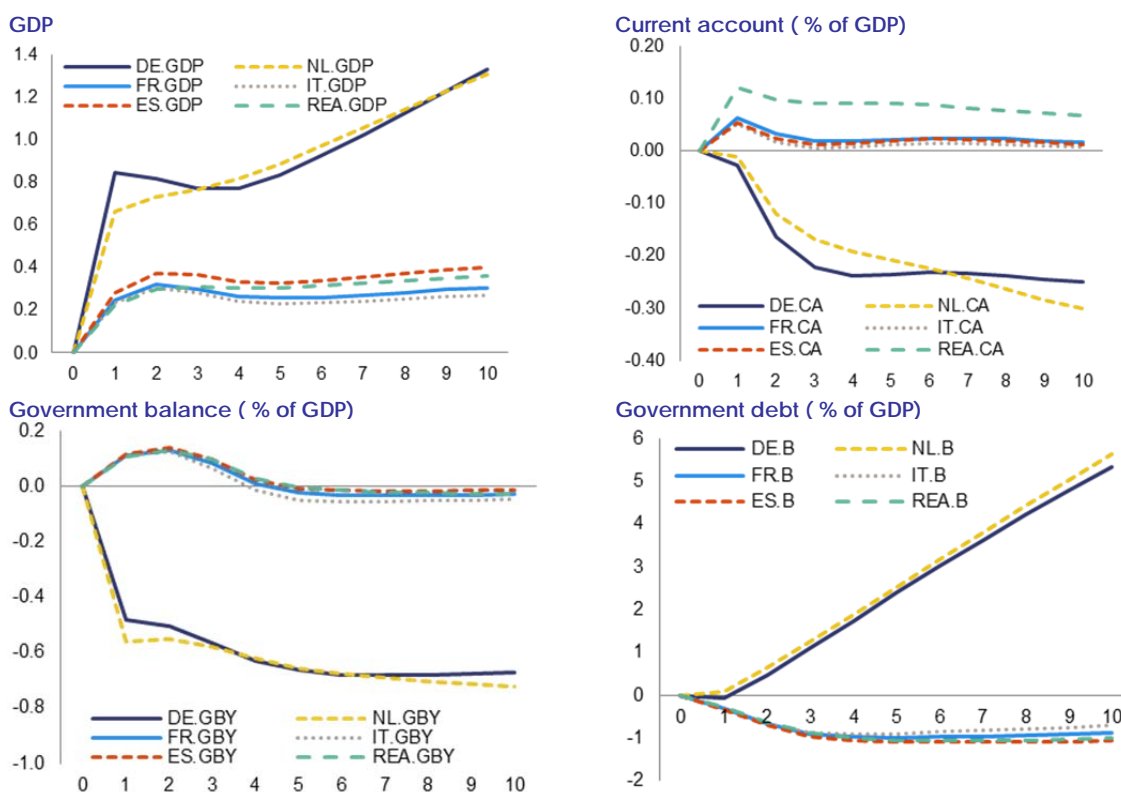
3.2 With monetary accommodation

When monetary policy accommodates the fiscal stimulus, the results are more favourable. Graph 4 shows the scenario when there is no interest rate response in the first two years of the stimulus. After that period, the policy rate gradually moves again towards a standard Taylor rule. As this is productive spending, accommodation by monetary authorities may not be an unreasonable assumption to make, but certainly at the current juncture, monetary policy is constrained at the zero lower bound and monetary policy can accommodate the fiscal stimulus.

Graph 4 shows the macroeconomic effects in this case. The increase in public investment raises GDP on impact by 0.85% in Germany and 0.7% in the Netherlands. Again, GDP effects are increasing over time as public investment is productivity enhancing, and GDP is about 1.3% higher after 10 years. The increase in the public deficit is initially around 0.5 pps. as automatic stabilisers reduce the impact on the government balance, but the deficit gradually increases as interest payments rise. Government debt increases gradually and is around 5 pps. higher after a decade.

The demand expansion in these two countries generate sizeable spillovers to the rest of EA, through a direct trade effect and now with constant interest rates a small euro depreciation. GDP in France, Italy, Spain and the rest of the EA is around 0.3% higher. Current accounts of Germany and the Netherlands fall by 0.25 pps, marginally less than in the first scenario due to the depreciation of the euro. The increase in current accounts in other member states is however small, not much more than 0.05 pp, slightly higher for the rest of the EA (Belgium, Austria, Finland and others) (Graph 4).

Graph 4: Investment stimulus in surplus countries with monetary accommodation



Note: Increase in public investment in DE and NL of 1% of GDP, constant policy rates for two years

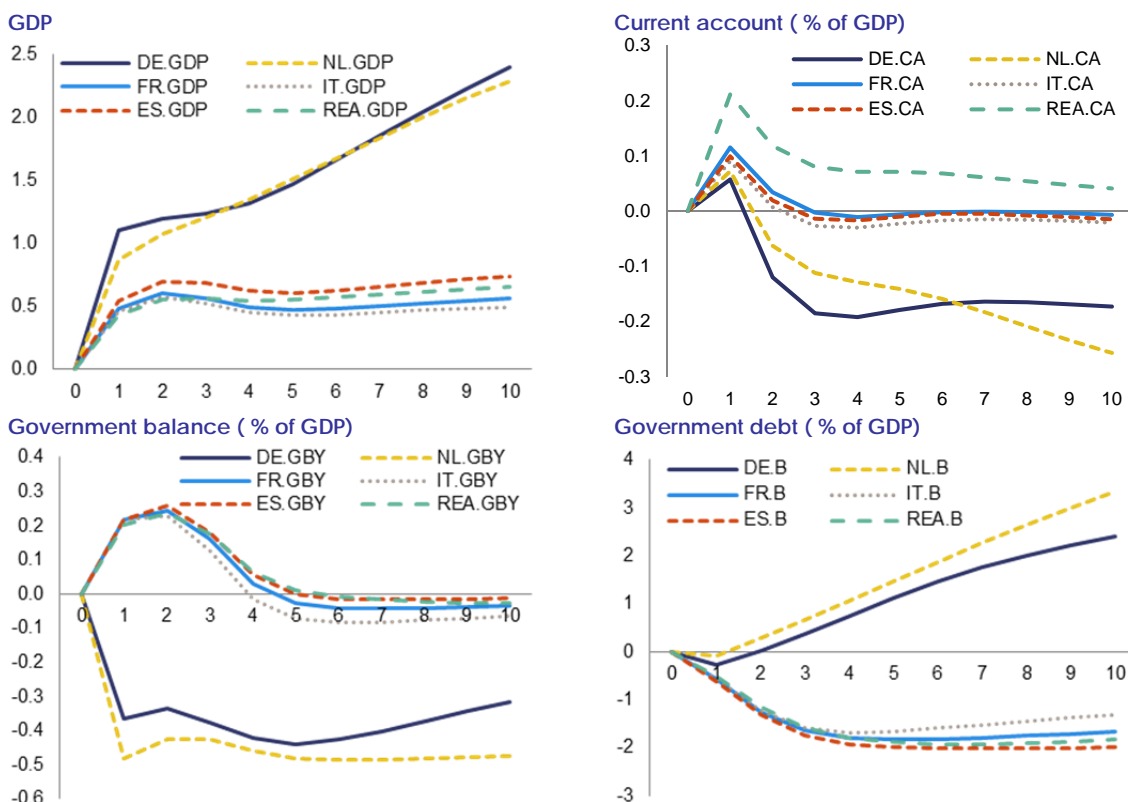
3.3 Higher efficiency of public investment

The long run GDP effect of higher public investment depends crucially on the assumed long run output elasticity of public capital, which determines by how much a higher stock of public capital raises the marginal productivity of the other inputs in production, i.e private capital and labour. Estimates for this elasticity from the empirical literature vary widely. In the model this output elasticity is set to a level such that the marginal product of public capital equals that of private capital ($\alpha_G = 0.09$). Although some authors use a lower value of e.g 0.05 (Leeper et al (2010)) our assumption is on the lower end of the range used in macro models. For comparison, in IMF WEO (October 2014) the elasticity of core infrastructure is set at 0.17, based on a meta-analysis by Bom and Ligthart (2014). Even in advanced economies in which measures of the quantity of infrastructure appear high relative to those in the rest of the Euro Area, as is the case for the Netherlands, there are deficiencies in the quality of the existing infrastructure stock. It is also important to stress that the increase simulated here would merely reverse steep cuts in government investment in recent years, many of which have led to backlogs in deferred

maintenance on the existing infrastructure stock, and are this unlikely to have below average rate of returns.

To show the importance of this technical assumption, the third scenario shown in Graph 5 assumes a higher value for this parameter of 0.17, in line with the mean estimate found in the literature. Monetary policy is again assumed to accommodate the stimulus. This raises the GDP effects in the countries undertaking the stimulus, with an increase in GDP of 2.4% after 10 years. It also leads to larger spillovers to the rest of the euro area, boosting GDP by around 0.5%. The larger productivity gains for Germany and the Netherlands however reduce the fall in their current accounts in the medium term as the competitiveness gains partly offset the demand effect. The impact on public finances is more favourable, as higher growth boosts tax returns and as a result the government balance deteriorates by less. The increase in government debt is now only 2.5 to 3 pps. after ten years, while debt ratios in the rest of the euro area are actually falling by 2 pps due to the positive GDP spillovers.

Graph 5: Investment stimulus in surplus countries with monetary accommodation, high efficiency



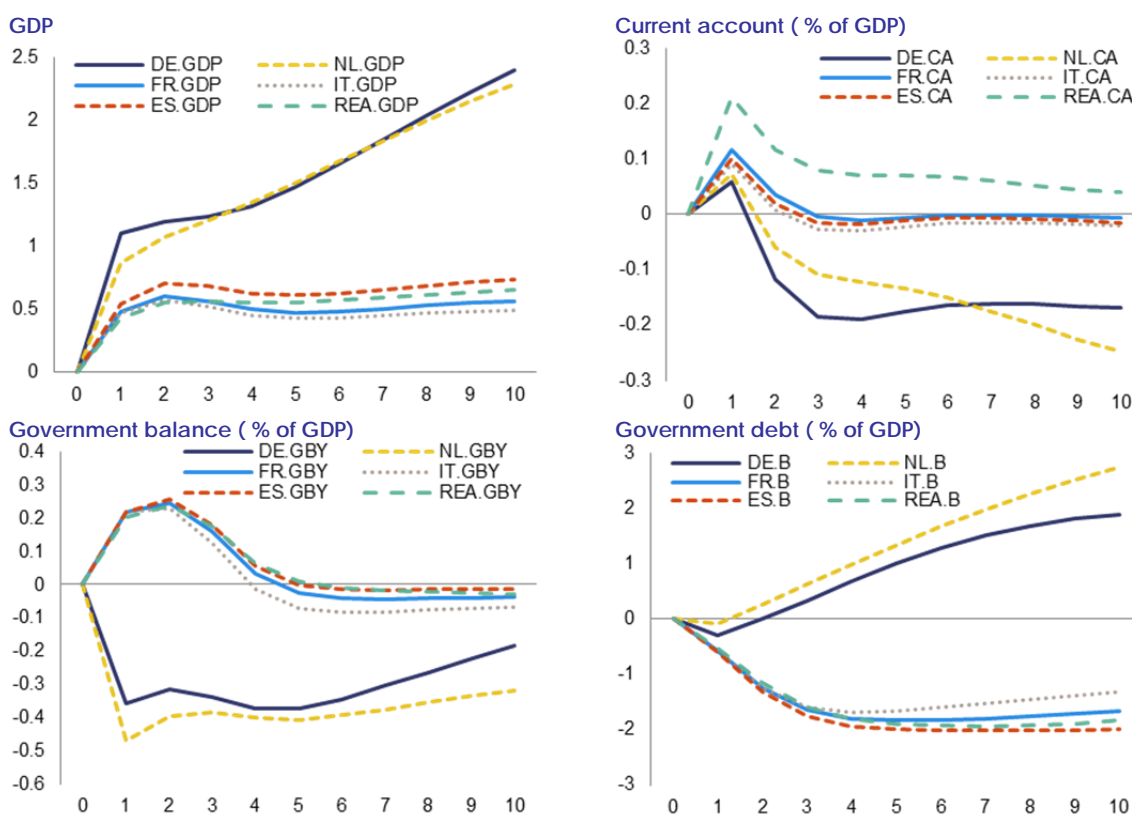
Note: Increase in public investment in DE and NL of 1% of GDP, constant policy rates for two years, assuming higher long run output elasticity of public capital (0.17)

3.4 Lower borrowing costs

As mentioned above, the implications for public finances may be more favourable than depicted in the previous scenarios as governments can borrow now at interest rates well below the 4% steady state interest rate assumed in the model baseline. Government bond yields for Germany and the Netherlands have fallen dramatically since the beginning of the crisis, and are now close to zero for 10 year bonds, and below 1% for 30 year bonds. This means these countries can lock-in into record low rates, which, assuming a long term inflation target of 2%, imply negative real interest rates. In this final scenario shown in Graph 6 the government interest rate for Germany and the Netherlands is reduced from 4% to 1%, while maintaining the other assumptions above of no interest rate reaction in the first two years, and a higher efficiency of public investment. The main impact is on the development of government debt which now accumulates to less than 2 pps. above baseline after ten years for Germany and to 2.8 pps. for the Netherlands.⁵ The GDP effect is actually marginally lower now, as lower interest payments to savers holding

government bonds leads to a downward adjustment in their consumption. GDP spillovers to the rest of the euro area are around 0.5% , but the adjustment in current accounts remains small. Government debt ratios in the rest of the euro area improve due to higher growth. While the current account rebalancing in the euro area is relatively small, the debt rebalancing is in fact more significant.

Graph 6: Investment stimulus in surplus countries with monetary accommodation, high efficiency



Note: Increase in public investment in DE and NL of 1% of GDP, constant policy rates for two years, assuming higher long run output elasticity of public capital (0.17), and lower borrowing costs in DE and NL (1%)

4. Concluding remarks

Model simulations shown here broadly confirm the view that a debt-financed increase in government investment will at the current juncture, with monetary policy constrained by the zero interest rate floor, have positive GDP spillovers to other trading partners. An increase in government investment can provide a boost to (potential) output, while at the current interest rates the (real) costs are extremely low. With record low government bond rates these low borrowing costs can be locked-in, and this provides an opportunity to bring forward public infrastructure projects which should, even when debt-financed, have a higher rate of return than present borrowing costs.

The simulations shown here confirm the positive GDP spillovers. The monetary policy assumption plays here a crucial role. Spillovers could be small in the short run when monetary policy reacts normally, but when nominal interest rates are constrained at the zero interest rate floor the GDP spillover effects can be sizeable. Domestic and spillover effects can be even larger when the new investment is directed to the most productive projects, while with current low borrowing

costs for the surplus countries the increase in government debt will be modest. In fact government debt ratios in the rest of the euro could fall.

However, it is also evident that the impact on current accounts is likely to be modest. A realistic increase in government investment can lead to a reduction in current account surpluses, but one cannot expect a, say, 1% of GDP level increase in domestic demand to make a larger dent in current account surpluses than we see in these model simulations, as these have been the result of below trend domestic demand growth for many years. Likewise the impact of a stimulus in surplus countries on current accounts in other individual euro area countries is positive but small.

References

- Blanchard, O., Erceg, C., and Linde, J., (2015), "Jump starting the euro area recovery: would a rise in core fiscal spending help the periphery?", NBER Working Paper 21426.
- Bom, P., Ligthart, J., 2014. "What Have We Learned From Three Decades Of Research On The Productivity Of Public Capital?," *Journal of Economic Surveys*, vol. 28(5), pages 889-916.
- Bundesministerium für Wirtschaft und Energie (BMWi), 2015, "Auswirkungen höherer öffentlicher Investitionen in Deutschland auf die Wirtschaft des Euroraums", Monatsbericht 7-2015.
- Deutsche Bundesbank (2016), "Zu den internationalen Ausstrahlwirkungen einer Ausweitung der öffentlichen Investitionen in Deutschland", Monatsbericht August 2016.
- Elekdag S., Muir, D., 2014, "Das Public Kapital: how much would higher German public investment help Germany and the Euro Area?," IMF Working Paper 14/227.
- IMF, 2014, "Is it time for an infrastructure push? The macroeconomic effects of public investment", Chapter 3 in *World Economic Outlook*, October 2014.
- In 't Veld, J. , 2013, "Fiscal consolidations and spillovers in the Euro Area periphery and core", ECFIN Economic Papers 506.
- Kollmann, R., Ratto, M., Roeger, W., in 't Veld, J., and Vogel, L. (2015), "What drives the German current account? And how does it affect other EU member states?," *Economic Policy*, 30, p. 47-93.

Endnotes

¹ One other difference in the Kollmann et al. model is that a tax rule is operating that stabilises the debt-to-GDP ratio, and the accompanying increase in taxes reduces private consumption. As a result of this partial tax financing, the trade balance effects are gradually reversed. In other QUEST simulations, this tax rule is switched off for 20 years and the stimulus is debt financed over that period.

² Input-output tables on which the QUEST import shares are based in the simulations in the following sections do not distinguish between private and public investment, and import shares are assumed to be equal.

³ Blanchard, Erceg and Linde (2015) consider a more general increase in public spending and focus on how a fiscal expansion in the core can boost growth in the periphery. Core in this setup is a larger group that consist of roughly two-thirds of the EA. They show that a fiscal expansion by the core economies of the euro area would have a large and positive impact on periphery GDP assuming that policy rates remain low for a prolonged period. An expansion of core government spending equal to one percent of euro area GDP would boost periphery GDP around 1 percent in a liquidity trap lasting three years, about half as large as the effect on core GDP. IMF (2014) focusses on infrastructure investment and argues the time is right for an infrastructure push as borrowing costs are low and demand is weak in advanced economies. In GIMF model simulations shown, projects could, even when debt-financed, have large output effects importantly without increasing the debt-to-GDP ratio, if clearly identified infrastructure needs are met through efficient investment.

⁴ The simulation may in fact overestimate the debt accumulation as government interest rates are currently significantly lower than the 4% assumed in the model baseline (see next scenario). In the long run, the debt-to-GDP ratio is stabilised in the model back to baseline levels through higher taxes. With a higher public capital stock the positive productivity effects are permanent.

⁵ Note that for Germany and the Netherland, with an impact multiplier around one, the stimulus is not self-financing, unlike in IMF (2014), where for a stimulus in all advanced economies the impact multiplier is above two, and the debt-to-GDP ratios decline on impact.

EUROPEAN ECONOMY ECONOMIC BRIEFS

European Economy Economic Briefs can be accessed and downloaded free of charge from the following address:

http://ec.europa.eu/economy_finance/publications/eeeb/index_en.htm

Titles published before July 2015 can be accessed and downloaded free of charge from:

- http://ec.europa.eu/economy_finance/publications/economic_briefs/index_en.htm
(ECFIN Economic Briefs)
- http://ec.europa.eu/economy_finance/publications/country_focus/index_en.htm
(ECFIN Country Focus)

HOW TO OBTAIN EU PUBLICATIONS

Free publications:

- one copy:
via EU Bookshop (<http://bookshop.europa.eu>);
- more than one copy or posters/maps:
 - from the European Union's representations (http://ec.europa.eu/represent_en.htm);
 - from the delegations in non-EU countries (http://eeas.europa.eu/delegations/index_en.htm);
 - by contacting the Europe Direct service (http://europa.eu/europedirect/index_en.htm) or calling 00 800 6 7 8 9 10 11 (freephone number from anywhere in the EU) (*).

(*) The information given is free, as are most calls (though some operators, phone boxes or hotels may charge you).

Priced publications:

- via EU Bookshop (<http://bookshop.europa.eu>).

