

Truger, Achim

**Working Paper**

## The golden rule of public investment: A necessary and sufficient reform of the EU fiscal framework?

IMK Working Paper, No. 168

**Provided in Cooperation with:**

Macroeconomic Policy Institute (IMK) at the Hans Boeckler Foundation

*Suggested Citation:* Truger, Achim (2016) : The golden rule of public investment: A necessary and sufficient reform of the EU fiscal framework?, IMK Working Paper, No. 168, Hans-Böckler-Stiftung, Institut für Makroökonomie und Konjunkturforschung (IMK), Düsseldorf, <https://nbn-resolving.de/urn:nbn:de:101:1-20160613781>

This Version is available at:

<https://hdl.handle.net/10419/144925>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

# WORKING PAPER

No. 168 • May 2016 • Hans-Böckler-Stiftung

## THE GOLDEN RULE OF PUBLIC INVESTMENT – A NECESSARY AND SUFFICIENT REFORM OF THE EU FISCAL FRAMEWORK?

Achim Truger<sup>\*</sup>

### Abstract

It is by now a widely shared insight that fiscal policy needs to be re-strengthened as a macroeconomic policy instrument within European macroeconomic policies: Recent experiences with austerity policies, new research regarding the size of the fiscal multiplier and the fact that monetary policy is obviously overstrained have led to this conclusion. As a consequence, increases in public investment are particularly necessary. Against this background this contribution discusses and proposes the introduction of the traditional public finance golden rule into the EU/Eurozone fiscal framework (Stability and growth pact (SGP), Fiscal Compact (FC)). Such a rule would exempt public (net) investment suitably defined from the relevant deficit targets of both the preventive and the corrective arm of the SGP as well as the FC. That way, fiscal policy would be upgraded and receive larger room for manoeuvre and public investment as a particularly growth enhancing public expenditure category would be strengthened. Different definitions are discussed and a pragmatic definition based on the national accounts with some modifications is proposed. The standard reservations against a golden rule are critically assessed, but mostly discarded. However, the potential limits of the golden rule are examined by way of pragmatic multiplier-based macroeconomic assessments: Would a golden rule have prevented the austerity crisis since 2010? Would other expenditure categories – particularly spending on social policy – have necessarily suffered? Would a golden rule leave sufficient fiscal leeway for expansionary fiscal policy in the current situation? The results are encouraging, yet they show, that the golden rule alone would not be sufficient to stabilise the Euro area economies.

**JEL classification:** E22, E61, E62, E65, H54, H62

**Keywords:** Golden rule, public investment, fiscal policy, austerity, Euro area

<sup>\*</sup> Berlin School of Economics and Law and Senior Research Fellow at IMK in Hans-Böckler-Foundation, Düsseldorf.

Achim Truger

## **The golden rule of public investment – a necessary and sufficient reform of the EU fiscal framework?**

### **Abstract:**

It is by now a widely shared insight that fiscal policy needs to be re-strengthened as a macroeconomic policy instrument within European macroeconomic policies: Recent experiences with austerity policies, new research regarding the size of the fiscal multiplier and the fact that monetary policy is obviously overstrained have led to this conclusion. As a consequence, increases in public investment are particularly necessary. Against this background this contribution discusses and proposes the introduction of the traditional public finance golden rule into the EU/Eurozone fiscal framework (Stability and growth pact (SGP), Fiscal Compact (FC)). Such a rule would exempt public (net) investment suitably defined from the relevant deficit targets of both the preventive and the corrective arm of the SGP as well as the FC. That way, fiscal policy would be upgraded and receive larger room for manoeuvre and public investment as a particularly growth enhancing public expenditure category would be strengthened. Different definitions are discussed and a pragmatic definition based on the national accounts with some modifications is proposed. The standard reservations against a golden rule are critically assessed, but mostly discarded. However, the potential limits of the golden rule are examined by way of pragmatic multiplier-based macroeconomic assessments: Would a golden rule have prevented the austerity crisis since 2010? Would other expenditure categories – particularly spending on social policy – have necessarily suffered? Would a golden rule leave sufficient fiscal leeway for expansionary fiscal policy in the current situation? The results are encouraging, yet they show, that the golden rule alone would not be sufficient to stabilise the Euro area economies.

**Keywords:** Golden rule, public investment, fiscal policy, austerity, Euro area

**JEL Classification:** E22, E61, E62, E65, H54, H62

### **Corresponding Author:**

Prof. Dr. Achim Truger

Vice Dean

Faculty of Business and Economics

Berlin School of Economics and Law

& Macroeconomic Policy Institute at Hans-Böckler-Foundation (Düsseldorf)

Badensche Straße 50-51

D-10825 Berlin

[www.hwr-berlin.de](http://www.hwr-berlin.de)

Tel.: +49 (0)30 30877-1465

Fax: +49 (0)30 30877-1199

E-Mail: Achim.Truger@hwr-berlin.de

# **The golden rule of public investment – a necessary and sufficient reform of the EU fiscal framework? <sup>1</sup>**

## **1. Introduction**

As the Euro area economy is still far from full recovery and deflationary dangers persist, the insight of both the public and policy makers as to the necessity of a macroeconomic policy change has increased recently. The calls for a more expansionary fiscal stance, above all for a boost to public – or publically supported – investment, have become louder, with the Investment for Europe Plan (Juncker-Plan) as the most prominent official policy reaction. Even before that plan there were some initiatives – as the introduction of the so called ‘investment clause’ under the Stability and Growth Pact (SGP) – to support and protect public investment. However, quite obviously, those past initiatives have failed, as public investment in the Euro area has decreased substantially since the onset of the crisis. In the so called periphery countries public investment expenditures have shrunk dramatically as a result of the austerity policies imposed on those member states. And despite all efforts growth forecasts for the euro area have been stagnating since summer 2014.

Obviously, a different approach to fiscal policy and to supporting public investment is needed. One natural candidate for such an approach would be the so-called golden rule of public investment. The rule is widely accepted in the traditional public finance literature and would allow financing net public investment by government deficits thus promoting intergenerational fairness as well as economic growth. Public investment increases the public and/or social capital stock and creates growth to the benefit of future generations. Future generations contribute to financing those investments via the debt service. Failure to allow for debt financing will lead to a disproportionate burden for the present generation via higher taxes or expenditure cuts and therefore most probably to underinvestment which is exactly what has happened in Europe under the austerity policies.

The European Commission has to date strongly resisted the introduction of such a golden rule, because supposedly it would not fit into the fiscal framework of the reinforced SGP and the fiscal compact and put fiscal sustainability at risk (European Commission 2004: 132 and 2012: 25). This, however, is somewhat ironic: Even the conservative German council of economic experts, as high ranking body of policy advice, not exactly known for an inclination

---

<sup>1</sup> Paper submitted to the Progressive Economy Call for Papers 2016 in the category ‘Reforming the Economic and Monetary Union’ (<http://www.progressiveeconomy.eu/content/annual-call-papers-2016-en>)  
Sections 3 to 4 of this paper are based on an updated version of Truger (2015a) and borrow heavily from Truger (2016) albeit with substantial revisions and updates.

towards loose budgets, included the golden rule in its proposal for a German debt brake (SVR 2007). Hence, the original blueprint for the German debt brake – and therefore also for the Fiscal Compact on the European level – included, in fact, a golden rule for public investment.

Therefore, the present article states the case for a golden rule and presents a concrete proposal for its introduction in the EU in order to strengthen and protect public investment and to increase growth in the short as well as in the long run while at the same time not sacrificing fiscal sustainability. However, the potential limits of the golden rule are examined by way of pragmatic multiplier-based macroeconomic assessments: Would a golden rule have prevented the austerity crisis since 2010? Would other expenditure categories – particularly spending on social policy – have necessarily suffered? Would a golden rule leave sufficient fiscal leeway for expansionary fiscal policy and non-investment expenditure in the current situation?

Section 2 gives a brief account of the development of public investment over the last 15 years and shows that austerity in the wake of the euro crisis has, in fact, led to disproportionately large cuts in public investment. Section 3 presents an attempt at operationalizing the theoretical concept of the golden rule. The basic theoretical idea and the short as well as long run growth effects of traditional public investment are presented. Definitions of public investment different from the standard one from the national accounts are discussed and some technical issues are addressed. Section 4 then turns to the question of implementing the golden investment rule in the present European fiscal policy framework. The golden rule of public investment and a European Investment Programme – similar to the 2008 European Recovery Programme – could be combined to boost and safeguard public investment and support the recovery. Section 5 shows the results of the multiplier-based simulations. Section 6 briefly draws the economic policy conclusions.

## **2. Austerity and the neglect of public investment in the euro area**

Fiscal policy in most developed economies has been dominated by consolidation efforts after the strong increase in government debt as a result of the global financial and economic crisis in recent years. Fiscal restriction was particularly strong in the Euro area because of the strict fiscal framework of the Stability and Growth Pact (SGP) and the additional policy reactions after the onset of the euro crisis. Above all the so called periphery countries (Greece, Ireland, Portugal and Spain) whose government bonds had come under speculative attacks from the financial markets were forced into austerity policies under the relevant rescue programmes and/or by the European Commission/Council strictly enforcing and even reinforcing the tight framework of the SGP (see Truger 2013). The change in general government structural

primary budget balance (SPB) over time is a standard measure of the fiscal stance, i.e. the discretionary changes in fiscal policy. According to the standard EU Commission estimates (European Commission 2015) the fiscal effort in the Euro area as a whole was in the dimension of 3 per cent of GDP within the three years from 2010 to 2013. In the periphery as an aggregate it was as large as almost 10 per cent of GDP within the four years from 2009 to 2013. However, the European Commission has already admitted that those estimates based on the change in the structural (primary) budget balance tend to underestimate the true discretionary consolidation efforts and has developed complementary indicators to assess fiscal effort (European Commission 2013: 101-132 as well as Carnot and de Castro 2015). Using the results by Carnot and de Castro (2015: 10) it must be concluded that the estimate of fiscal effort based on the SPB underestimates discretionary fiscal effort for Portugal by 20 per cent, for Ireland by 45 per cent, for Spain by almost 75 per cent and for Greece by almost 90 per cent. In this case, the true fiscal effort in the periphery as a whole from 2009 to 2013 would be 16 per cent of GDP instead of “only” 10 per cent as indicated by the SPB (see similarly Darvas et al. 2014: 10-15).

**Table 1: ‘fiscal effort’ = cumulative change in the SPB against 2009 for 12 euro area countries, 2010-2016 in % of GDP**

	2010	2011	2012	2013	2014	2015
<b>Euro area (12 countries)</b>	-0.1	-1.4	-3.3	-4.4	-5.0	-5.2
<b>Belgium</b>	-0.2	0.1	-0.6	-1.4	-1.5	-1.4
<b>Germany</b>	1.6	0.5	-0.8	-1.1	-0.8	-0.3
<b>Ireland</b>	-1.6	-3.0	-4.9	-8.3	-10.8	-11.9
<b>Greece</b>	-7.4	-13.4	-17.5	-21.0	-22.2	-23.2
<b>Spain</b>	-1.4	-2.4	-5.9	-8.3	-9.6	-9.4
<b>France</b>	-0.4	-1.7	-2.6	-3.3	-4.3	-4.9
<b>Italy</b>	-0.6	-1.3	-4.8	-5.9	-6.7	-7.4
<b>Luxembourg</b>	0.5	-0.8	-2.1	-2.7	-2.9	-2.2
<b>Netherlands</b>	-0.2	-1.0	-2.5	-4.8	-5.6	-6.9
<b>Austria</b>	0.3	-0.8	-1.8	-2.5	-2.6	-3.0
<b>Portugal</b>	0.0	-3.9	-7.7	-9.5	-9.5	-9.5
<b>Finland</b>	1.3	0.3	0.3	-0.7	-1.1	-2.2

**Source: Truger (2015b and 2015c).**

Similar results can be obtained by using different methods of cyclical adjustment and calculating the structural government balance. Table 1 shows the results for the cumulative fiscal stance (cumulative change in the SGP with potential GDP as forecasted by the European Commission in spring 2010) from 2009 to 2015 derived by Truger for the ‘old’ euro area with 12 member states (Truger 2015b and 2015c). The overall extent of fiscal consolidation until 2015 was more than 5 % of GDP for the euro area as a whole, with Greece (23.2%) and the other periphery countries particularly standing out (9.4 - 11.9 %).

The strong fiscal pressure in the euro area led to particularly strong cuts in public investment. Unlike many other spending categories public investment is not mandatory and – in the absence of institutions like the golden rule – politically relatively easy to cut. In fact, this is exactly what happened in the countries under severe budgetary pressures: In the periphery government gross fixed capital formation (=public investment) declined from slightly below 10 per cent of total government expenditure on average from 1999 to 2007 to only 4.5 per cent in 2013, whereas in most other countries it remained relatively stable. Darvas et al. (2014: 15-27) present a more detailed account of the composition of expenditure side consolidation measures from 2009 to 2013. Obviously, capital expenditure was the most widespread and largest component of consolidation measures, but compensation of employees and other current primary spending – as well as in some cases social spending – were also substantially affected.<sup>2</sup>

**Table 2: cumulative reduction in net fixed capital formation in relation to cumulative consolidation volume for 12 euro area countries, 2010-2016 in %**

	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
<b>Euro area (12 countries)</b>	181.7	39.6	24.3	20.3	20.3	19.5
<b>Belgium</b>	22.8	-	-10.7	3.1	1.4	-1.3
<b>Germany</b>	-	-	9.7	10.0	23.0	99.5
<b>Ireland</b>	20.8	42.6	33.2	22.3	15.5	10.9
<b>Greece</b>	30.6	26.7	20.7	13.1	9.7	11.0
<b>Spain</b>	41.2	67.4	50.8	39.6	34.8	32.6
<b>France</b>	30.1	20.1	11.4	10.6	15.5	16.3
<b>Italy</b>	90.0	46.1	18.5	18.9	19.5	16.4
<b>Luxembourg</b>	-	27.2	22.5	38.3	34.4	35.9
<b>Netherlands</b>	135.4	39.8	27.1	17.0	16.4	13.1
<b>Austria</b>	-	39.1	24.7	12.8	13.8	12.7
<b>Portugal</b>	-	22.4	26.3	23.5	24.5	27.5
<b>Finland</b>	-	-	-	2.2	2.5	8.9

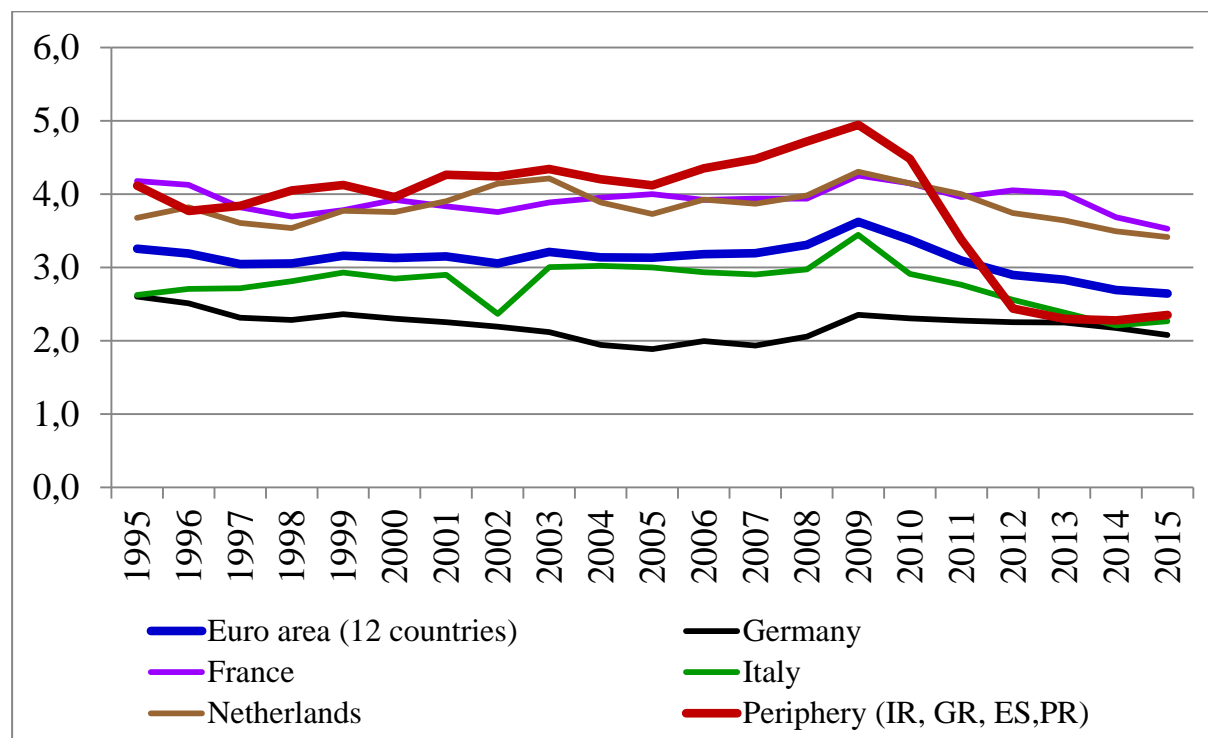
**Source: European Commission (2016); Truger (2015b and 2015c); author's calculations.**

Table 2 shows the volume of the reductions in net investment relative to the total consolidation volume. The general pattern is that of particularly large relative investment cuts in the first years of consolidation which afterwards decrease a little over time when other austerity measures set in that are more difficult to implement and take longer time. For the euro area as a whole net investment reductions constituted 20 % of total austerity measures. For Spain and Portugal the investment related austerity was substantially stronger.

---

<sup>2</sup> See Darvas et al. (2014) for an analysis of austerity's effect on poverty and social hardship.

**Figure 1: General government gross fixed capital formation (ESA 2010) in the euro area, the European Periphery and selected countries in per cent of GDP, 1995-2015**



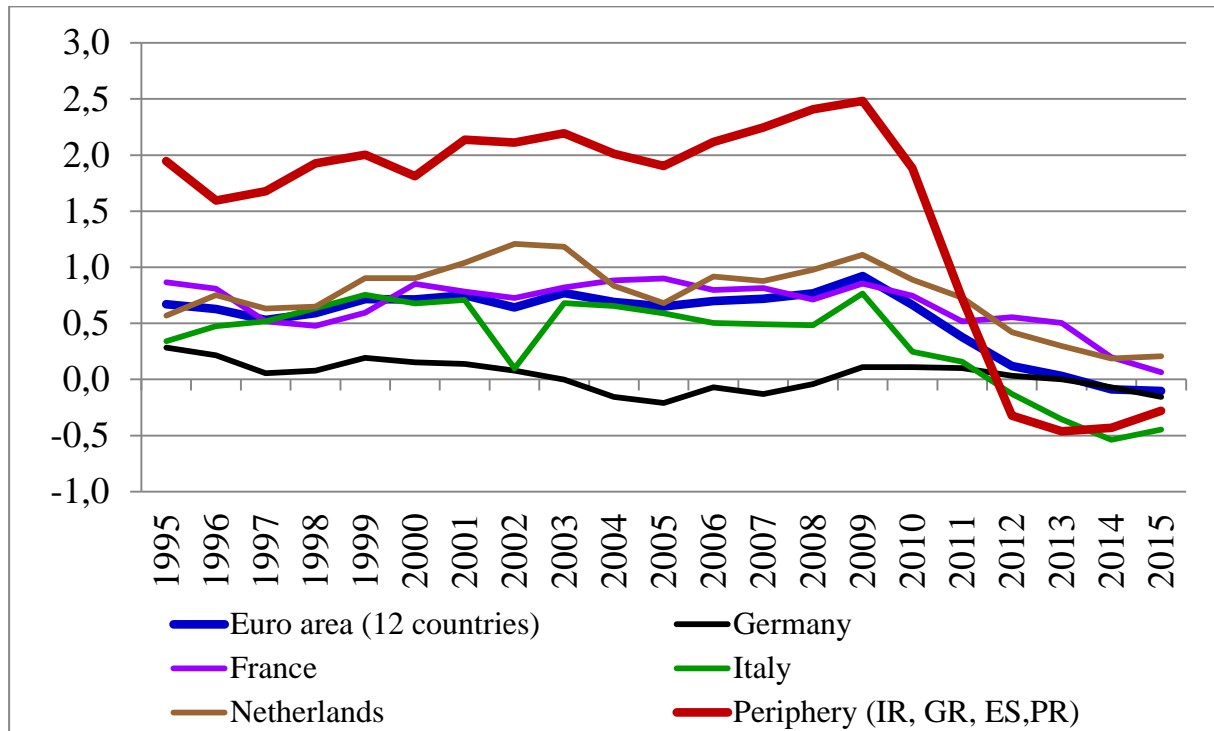
Source: European Commission (2016); author's calculations.

The development of gross public investment in relation to GDP clearly shows the decline (see Figure 1): It almost halved from more than 4 per cent before the crisis to only 2.2 per cent of GDP since 2013 in the European periphery. Net public investment, i.e. gross investment minus depreciation, decreased from about 2 per cent of GDP to a negative -0.6 per cent of GDP – the net public capital stock in the periphery was shrinking. For the euro area as a whole and for Germany net public investment has been negative since 2013 (see figure 2).

There can be no doubt, that austerity policies in the Euro area have negatively affected public investment in a disproportionately strong manner.



**Figure 2: General government net fixed capital formation (ESA 2010) in the euro area, the European Periphery and selected countries in per cent of GDP, 1995-2015**



Source: European Commission (2016); author's calculations.

### 3. The golden rule: From theory to operationalization

#### 3.1. The pay-as-you-use-principle and intergenerational equity

The golden rule has been a widely accepted traditional public finance concept for the handling of government deficits for decades (see Musgrave 1939 and 1959: 556-575). It strives for an intertemporal realization of the pay-as-you-use principle in the case that present government spending provides future benefits. It allows financing such spending (=net public investment) by government deficits thus promoting intergenerational equity. Net public investment increases the public and/or social capital stock and provides benefits for future generations. Therefore, it is justified that future generations contribute to financing those investments via the debt service. Future generations inherit the burden of public debt, but in exchange they receive a corresponding public and/or social capital stock. Failure to allow for debt financing of future generations' benefits will lead to a disproportionate burden for the present generation through higher taxes or lower spending creating incentives for the underprovision of public investment to the detriment of future generations. This general incentive problem may become exacerbated in times of fiscal consolidation when cutting public investment may seem the politically easiest way of reducing the budget deficit. As demonstrated in section 2,

the recent experience with austerity policies shows that this danger is real and has, in fact, materialised in the most striking manner. Independently of the current crisis, there is evidence that fiscal contractions were a key factor responsible for the decline in public investment in earlier decades (Välilä et al. 2005; Turrini 2004: 9-26).

Although the general idea behind the golden rule is most plausible and easy to understand, its operationalization is difficult. The most difficult problem is to find a workable and economically sensible definition of the term ‘public investment’ that allows for government deficits. Theoretically, any government action that creates benefits – in the widest sense – for more than one period may qualify for this. However, the literature usually focusses on concrete future material economic benefits in terms of higher productivity and growth. The question for an individual potential investment project then becomes whether it creates enough public and/or social capital so that its returns are higher than or at least equal to its costs in terms of interest payments and possibly additional costs. Ideally, if the returns are high enough debt sustainability would automatically be satisfied as the additional growth would decrease or at least stabilise the debt to GDP ratio (IMF 2014: 110). The optimal approach of defining public investment that qualifies for deficit finance would then be to include all public spending projects that create sufficient returns in terms of higher future productivity and growth. Obviously, such a classification process would be extremely costly and unfeasible in practice. Therefore, the central question on a macroeconomic level is, whether general categories of public spending can be identified that are usually associated with sufficiently higher growth and productivity. Of course, such a pragmatic approach necessarily risks including types of public spending that should not be qualified as investment as well as excluding types of public spending that should correctly be classified as investment.

However, despite the difficult questions from a theoretical point of view that strives for optimality, the concept of the golden rule has many advocates in academia starting with Richard A. Musgrave (1939 and 1959), one of the founding fathers of modern public finance. In the context of the fiscal policy debate in the EU many economists have criticised the EU fiscal framework of the SGP for its lack of a golden rule of public investment and correspondingly proposed to introduce such a rule into the framework (e.g. Fitoussi and Creel 2002: 63-65; Blanchard and Giavazzi 2004; Barbiero and Darvas 2014; Dervis and Saraceno 2014). And, last but not least the German council of economic experts had delivered a proposal that was to become more or less the blueprint for the German debt brake, which

explicitly expressed the need to include the golden rule as important element of the fiscal rule (SVR 2007).

The critical question for the justification of the golden investment rule then is whether public investment is productive, i.e. whether it increases productivity and growth. The natural starting point for the analysis is the debate about the growth effects of traditional public investment, i.e. mainly traditional infrastructure investment as classified in the national accounts, as it has received the most attention in the literature.

### **3.2. (Traditional) public investment and growth in the long run**

The central question of the long-run growth effects of public investment has received much attention in the literature (for an overview see Romp and de Haan 2005; Melo et al. 2013; Bom and Ligthart 2014). From a theoretical point of view it is most plausible that public investment, especially if it focusses on “core” infrastructure like transport facilities (roads, railways, ports, airports), communication systems as well as power generation and other utilities should be productive and growth enhancing. The public infrastructure stock in this sense is simply indispensable for most productive processes: Without water and energy supply, without transport capacities most production processes would simply be unthinkable. It is, therefore, plausible to think of public infrastructure as an input factor that is complementary to private capital and labour inducing additional private investment and labour supply.

However, at least two qualifications should be made. First, for additional public infrastructure to be productive it should not be abundant. Although the quantity and quality of infrastructure is difficult to measure, on the basis of the World Economic Forum’s Competitiveness report the IMF (2014: 79-81) concludes that the overall quality of infrastructure and that of roads has clearly (slightly) decreased from 2006 to 2012 in Germany ( France) and that it is lagging behind in Italy. This is at least a hint that there is room for improvement. It is also a hint that net public investment must not necessarily be into completely new infrastructure projects, but that maintenance investment may also have an important role to play. Second, although positive growth effects from core infrastructure investment are most plausible from a theoretical point of view, not all of public investment as defined in the national accounts is into core infrastructure. In fact, a substantial part of public investment is investment into equipment as well as public buildings, e.g. for administration, education and hospitals. For such investment a direct positive contribution to private production processes may be more difficult to establish. However, for those countries for which data on both the public capital

stock as a whole as well as specifically on public infrastructure is available, the correlation between the two is strong, so that overall public investment may serve as a proxy for infrastructure investment (IMF 2014: 80).

Empirically, as usual in economics, the effects are contested in the literature. The famous study by Aschauer (1989) using a production function approach found a very high elasticity of output with respect to the public capital stock. This would have meant an extremely high return on public investment, indeed, much higher than imaginable for private investment. In the following debate many different definitions of public (infrastructure) capital were used, different estimation techniques and variations of Aschauer's original approach were introduced. Furthermore, apart from Aschauer's original production function approach also the cost-function approach, times series analysis as well as cross section estimations were applied. Although the results differed very much and some studies found no or even negative effects of public investment on growth, the general conclusion is that there is a positive growth effect, but that it is much smaller than originally claimed by Aschauer (see Romp and de Haan 2005; Melo et al. 2013).

**Table 3: Implied marginal returns to public investment in per cent**

	all public capital		core public capital	
	Regional	national	regional	national
<b>short term</b>	17.4	10.2	24.0	16.8
<b>long term</b>	28.0	20.8	34.6	27.4

Source: IMF (2014: 86); Bom and Ligthart (2014: 907-908); author's calculations.

Bom and Ligthart (2014) conducted meta-regressions including 68 studies with 578 estimates for the public capital-growth nexus and confirm this basic conclusion for the period 1983 to 2008. According to their results, the average output elasticity of public capital is 0.082. Conditional elasticities vary depending on whether they refer to the short or the long run, to all public capital or core infrastructure and to regional or national investment. They are higher for core infrastructure, for regional investment and for the long run. Table 3 shows the implied marginal returns which are in the range between 10 per cent (short run, national, all public capital) to 34.6 per cent (long run, regional, core infrastructure). Whereas the latter marginal return is large enough to justify deficit-financed public investment even under pessimistic assumptions about the user cost of capital (real interest rate plus depreciation rate), the former would have to rely on more favourable conditions. However, the implied

long term marginal returns even in the case of all public capital for national and regional investment with 20.8 and 28 per cent are considerably high. All in all, therefore, one may safely assume traditional public investment to have considerably positive growth effects.

### **3.3. (Traditional) public investment and growth in the short run**

In addition to the more long-run supply-side effects the more short-run demand-side effects of public investment must also be addressed. The analysis proceeds in two steps. In the first step the question of fiscal policy effectiveness as such, irrespective of the particular instrument, must be clarified, before in the second step the comparative effectiveness of the different instruments, i.e. different expenditure or revenue side categories can be addressed.

As to fiscal policy effectiveness the traditional pre-crisis empirical studies usually found positive multipliers. As suggested by the standard Keynesian textbook models and the Haavelmo-Theorem expenditure multipliers were typically substantially larger than revenue side ones (see e.g. the overviews by Hemming et al. 2002, Arestis and Sawyer 2003, Bouthevillain et al. 2009). Many of the more recent studies confirm the earlier multiplier estimates and in many cases even go substantially beyond them (Gechert 2015 and Gechert and Rannenberg 2014). As to the question of the relative size of the public investment multiplier, the pre-crisis literature as a rule of thumb found it to be (slightly) above one and therefore slightly larger than for other spending categories so that public investment in addition to its long term economic advantages could be seen as the most effective short-run fiscal policy instrument. Some of the recent studies even come up with much larger (relative) estimates of the investment multiplier. Auerbach and Gorodnichenko (2012) obtain values larger than two with a maximum estimate of larger than four whereas the estimates for government consumption spending are “only” at about 1.4.

Based on this result, Barbiero and Darvas (2014: 8-9) conclude that a more growth-friendly consolidation in the euro area would have been possible if public investment spending had been preserved at the cost of cutting current spending. However, this conclusion does not seem fully convincing: While it is plausible to preserve public investment it is not clear whether cutting government consumption is the relevant and sensible alternative: First, although the multiplier estimate for consumption spending referred to is smaller than the investment multiplier, it is still substantially larger than one so that the damage of austerity policies would still have been very large even under the more “growth-friendly” strategy. Second, judgment should be based on a broad overview of different studies. Gechert (2015) and Gechert and Rannenberg (2014) conducted meta-regressions including 104, respectively

98 empirical multiplier studies controlling for different study characteristics. They also generally find higher investment multipliers as compared to their consumption counterparts (around 1.6 vs. 1), but the difference is certainly not as large as in the Auerbach and Gorodnichenko (2012) paper. Third, in the case that fiscal restriction is unavoidable, the whole set of available instruments should be taken into account. This leads to the conclusion that on average cutting government spending is unnecessarily painful, because the average estimates of the revenue side multiplier are much lower than those for the consumption or overall government spending multiplier. On average Gechert (2015) and Gechert and Rannenberg (2014) also find systematically smaller multipliers for government transfers.

This can, however, not serve as an argument for cutting social transfers for consolidation purposes: Apart from the highly problematic social impact, there is evidence that the transfer multiplier is particularly high during recessions (Gechert and Rannenberg 2014). Therefore, a much more growth-friendly consolidation could be achieved via tax increases, which – from a standard Keynesian perspective – should mainly focus on high incomes and wealth. An even more growth-friendly consolidation could be achieved by spending part of the additional revenue from suitable tax increases on increased public investment or other expenditures.

All in all, therefore, the empirical literature on short-run effects of fiscal policy strongly supports protecting public investment from consolidation pressures and using it to stimulate the economy. However, the substantial demand-side effects of other spending categories, particularly government consumption, should also not be neglected.

### **3.4. Towards an economically plausible operationalization of public investment**

Some thoughts are necessary on whether the traditional concept of investment in the national accounts is fully adequate or whether some modifications seem necessary. One important thing to notice in this context is, that the definition of (public) investment has changed in the recent general revision of the system of national accounts and the transition from the old system ESA 1995 to ESA 2010 (see Dunn et al. 2014). In general the transition to ESA 2010 and the accompanying further changes have led to an increase in gross public investment with marked differences between the countries. For net investment on average the changes are small as the increases in gross investment have almost completely been compensated by correspondingly higher depreciation.

A first change has to do with spending on research and development. Whereas before the revision, mostly tangible assets (construction and equipment) and a small fraction of

intangible assets were counted as investment, after the revision also spending on research and development is included. From an economic point of view this seems justified as it is highly plausible that public R&D spending in research institutions or universities or also as grants given to the business sector may be productive, although there is no clear evidence as to the growth effects, yet. In addition, public R&D spending suffered under the strong fiscal contraction (see Veugeleers 2014). This change should be the most important quantitatively in explaining the increase in gross investment for many countries.

A second change is highly problematic: Military spending on weapons systems is now counted as fixed investment, the reason being that “the new system recognises their productive potential for the external security of a country, over several years.” (Dunn et al. 2014: 10). However, this classification can be criticised on ethical grounds: Weapons systems are potentially destructive and if actually used they destroy productive capital instead of increasing it. Indeed, that was precisely the reason, why they were previously recorded as immediately consumed under ESA 1995. Furthermore, it is highly questionable whether the fiscal framework should actively encourage military spending and a potential arms race. The ethical questions apart, spending on weapons systems can hardly be considered as a particularly growth enhancing expenditure category. Theoretically, it is not clear how the marginal contribution of military investment to national security should be measured. Indeed, military investment was explicitly excluded from many studies on the long term growth effects of public investment. Aschauer’s original contribution did not find military spending to be important for economic productivity (Aschauer 1989) and Gechert (2015) found in the meta-regressions that the multiplier for military spending was substantially lower than that for traditional public investment and below one.

A third change occurred in the delimitation of the government and the private sector. The classification has become stricter in most cases in the sense that some companies/non-profit organisations closely related to the public sector had to be reclassified from the private to the government sector. This statistical enlargement of the government sector may partly remove one shortcoming of the investment definition in the national accounts: Investment grants paid by the public sector to private companies are not classified as investment expenditure. In the case that a formerly private company which receives investment grants increasing its investment expenditures is reclassified to be part of the public sector, the additional investment spending will now be counted as government investment. However, if a public investment grant is spent on investment by a recipient company then from an economic point

of view it should generally not make a difference whether the company is classified as public or private. Therefore, for purposes of the golden rule, investment grants paid from the public to the private sector should be classified as public investment.

Of course, there may be other expenditure categories that may be equally or even more beneficial. A natural candidate is public spending on education or health care which in the existing system of national accounts is classified as current expenditure. It has been argued that privileging traditional, mostly physical investment in infrastructure and equipment and neglecting those other forms of investment in an economic sense may distort the optimal allocation of resources with potentially unclear implications for efficiency, growth and welfare (Turrini 2004: 29-30). However, in the presence of strong evidence for considerably positive growth effects of traditional public investment it would seem overcautious to forego the advantages of the golden rule. Indeed, a stepwise approach is much more convincing. The economic case for including other types of spending into the golden rule should be checked. If inclusion seems rational but at the current stage difficult to implement for statistical or other reasons, then the golden rule should as a first step be applied to traditional investment. As soon as the open questions with respect to other expenditure categories are solved, their implementation can follow as a second step.

Should other potentially growth enhancing types of government spending be classified as investment? In principle they should as long as it can be shown that the growth effect to be expected is at least as large as that of traditional public investment. The natural candidate for this would be education expenditure. Education as investment in human capital is crucial from the point of view of endogenous growth theory (Lucas 1988) and empirical research suggests that the private as well as social rate of return of education can be assumed to be very high (Psacharopoulos and Patrinos 2004; Card 2001). Although it is difficult to reliably compare the estimated rate of return for different types of expenditure, it would at least be plausible to include public education expenditures under the golden rule. This is also the general conclusion drawn by most advocates of the golden rule.

However, at the present stage it is difficult to implement this in a convincing way. First, an exact definition of the relevant education expenditure would have to be given which is not straightforward. Second, in order to be consistent with the golden rule, net education investment would have to be measured, i.e. depreciation would have to be deducted. According to the SVR (2007: 80-81) based on Ewerhart (2002 and 2003) depreciation of the German human capital stock, relevant for such a calculation, would be in the order of



magnitude of 95 per cent of total education spending. This particular result stems from the demographic development in Germany and must not necessarily be a very plausible way of quantifying depreciation of human capital investment. But it shows that there are some difficult conceptual issues that would have to be resolved before education expenditure could be properly included into the golden rule.

There are other expenditure categories that might be considered as investment under the golden rule. Indeed, from a supply-side perspective some types of social spending may well be highly productive, because they increase labour supply and production: Health expenditures, if effective, will contribute to a more stable and larger workforce. Spending on child care can substantially increase parents' labour force participation (Bauernschuster and Schlotter 2015). The same may be said for spending on social work and integration. All of this could lead to higher labour force participation and therefore contribute to higher growth and, at the same time, to one of the main Europe 2020 goals. Obviously, it is not easy to find adequate definitions and estimating depreciation in order to derive net investment may be even more difficult.

The fact that at the current stage there are difficulties, however, does not mean that an economically rational and workable definition of potentially relevant other investment expenditures does not exist, at all. It only means, that for the first stage of introducing the golden rule one should better rely on the traditional definition of public investment from the national accounts.

### **3.5. Some technical aspects of implementation**

Even if – for practical reasons – the golden rule were initially limited to traditional public investment, some technical questions of implementation would have to be resolved. The prescriptions for the government in terms of the national accounts will have to be operationalised in terms of standard financial government accounts. This usually involves correcting for privatization revenues, loans and investment grants between government units (SVR 2007: 76.). However, for the general government this is a procedure that is familiar also in the current fiscal framework in which all national governments have to regularly submit their stability programmes according to the definitions of the system of national accounts. Problems might arise for the subnational levels of government, particularly for budgetary planning at the local level in which the new conventions would most probably have to be newly implemented.

Furthermore, depending on the design of the existing systems of fiscal federalism in the member states questions as to the vertical and horizontal allocation of the general government investment deficit allowance among and on the different federal levels may occur. For example, if the municipal level is the main investor and a substantial part of its investment is currently financed through own resources then the implied deficit and debt ratios for the municipalities under the golden rule may become very large or collide with existing national deficit constraints for the subnational levels. Obviously, this problem could be tackled by suitable investment grants from higher federal levels which would then also be allocated the corresponding deficit allowance. The golden rule may in the medium term actually be used for an investment-friendly reform of fiscal federalism.

Another problem that has always been stressed in the discussion about the golden rule (e.g. Turrini 2004: 5-6) is the estimation of depreciation that is necessary to determine net investment, i.e. gross investment net of depreciation. In the absence of dual accounting in the government financial budgetary accounting systems these have to be estimated for the different federal entities. Due to lack of data, for the subnational levels this may require some less than perfect but workable technical conventions, especially for calculating and distributing depreciation between subnational governments. However, the German council of economic experts in its golden rule proposal recommended merging financial accounts and national accounts as a pragmatic solution in the absence of dual accounting. Values for gross investment could be taken from the financial accounts and values for depreciation from the national accounts. Depreciation could then be distributed to the different federal states according to its share in gross investment (SVR 2007: 77). If the technical difficulties of estimating depreciation are assessed to be overwhelming, as an alternative, a certain percentage of gross public investment, e.g. in the range of 20 per cent to 50 per cent, could be used as a proxy of net investment.

After all, one should not exaggerate the conceptual and technical problems of implementing the golden rule. It should be kept in mind that the current fiscal framework in the EU relies to a large extent on complex non-observable concepts that are constantly under revision like the output gap and the cyclically adjusted budget balance (Barbiero and Darvas 2014: 10). This was also decidedly the position of the German council of economic experts when defending its concept for the golden rule:

“Despite these limitations it would be exaggerated to completely discard the golden rule with recourse to the inconveniences of reality. Investment related borrowing may

meet the requirements of the golden rule but in an imperfect manner so that a really convincing concept cannot be realised in its pure form. However, a complete ban of investment related borrowing cannot even be underpinned by a theoretically plausible argument.” (SVR 2007: 80; author’s translation)

## **4. Implementing the golden rule in the European fiscal framework**

### **4.1. A pragmatic proposal for a European golden investment rule**

As a pragmatic first step towards the golden rule it should apply for government fixed capital formation as defined in the national accounts with small modifications: Military spending on weapons systems should not count as investment whereas public investment grants to firms or non-profit organisations should be counted. The rule should apply to net investment, i.e. depreciation should be deducted for the rule to measure properly increases in the net public capital stock.

The golden rule could then be applied within the current fiscal framework of the SGP and the fiscal compact by deducting net public investment as defined above from member states’ relevant deficit measures, i.e. from the government deficit under the corrective arm and the structural deficit under the preventive arm of the pact and the fiscal compact. In effect, this means that the threshold for an excessive deficit as well as the medium term budgetary objective would be increased by the amount of net public investment. In order to prevent a conflict between the golden rule of public investment and the goal of stabilizing public debt below 60 per cent of GDP an upper limit for deductible net investment spending could be set at 1 or 1.5 per cent of GDP. The limit might not be set as a threshold above which all net investment will be fully relevant for the public deficit but rather as a limit to the percentage of net investment that is deductible from the deficit measures in order to provide incentives for public investment as a whole and prevent the category as a whole from cuts. This may seem like a rather academic question given the fact that most member states’ net investment was typically below 1.5 per cent of GDP even before the crisis. It might, however, gain relevance if a gross definition of public investment would have to be used for the golden rule or if additional expenditure categories would be classified as public investment.

Apart from conceptual advantages, the focus on net investment has the additional advantage of providing a strong incentive for governments in countries where net public investment is currently negative, i.e. where the public capital stock is decreasing because, compared to the

status quo, their fiscal constraints would otherwise tighten. Although this is a welcome incentive in the medium term, countries should in the short term be given some time to adjust their net investment.

The Commission and member states should over the medium term actively promote ways of improving the statistical measurement of public investment and of improving the government accounts, in particular as concerns the calculation of depreciation. Furthermore, research and debate should also be directed towards identifying other expenditure categories that could qualify as public investment and where applicable towards how to include them under the golden investment rule.

#### **4.2. Sound implementation of the golden rule in the medium term**

One essential question is whether the introduction of the golden rule proposed here would be compatible with current EU law or whether a change of Council regulations or the Treaty would be necessary. With respect to the old Treaty, Blanchard and Giavazzi (2004: 15) argued that the old Art. 104.3 would have allowed implementing the golden rule without any treaty changes by changing the corresponding Council regulations, because it stated that in the report to be prepared by the Commission it should also be taken into account whether the government deficit exceeded government investment expenditure. However, since 2008 Art 2 (3) of Protocol No. 12 about the excessive deficit procedure annexed to the Treaty states that investment is to be understood as gross investment. Therefore a permanent interpretation as net investment would probably be difficult to justify. In the end, this is a legal issue that is difficult to resolve from an economist's point of view. The change of the Council regulation deemed necessary, however, would still require unanimous consent within the Council.

For some time, however, the introduction of the golden rule for public investment could probably be approximated even without any changes in the current institutional framework, if the European Commission and the European Council were willing to more actively use the interpretational leeway within this framework (see table 2 for an overview of measures). Actually, the clarification as to the interpretation of the Pact that the Commission has just given can already be seen as illustrating steps in that direction (European Commission 2015b).

At least additional net investment could be justified if it came in the form of a temporary investment programme, analogous to the way the Commission interprets contributions to the EFSI. Additionally or alternatively, it may be possible to treat an investment programme as

structural reform that temporarily allows for deviations from MTO or the adjustment path towards it. As to the ‘investment clause’ it should be possible to implement it as a ‘small-scale golden rule’ under these conditions. Reference to adverse cyclical conditions might help to increase leeway even further, although this could create the danger of a stop-and-go investment policy, if cyclical conditions improve as can be expected under an investment programme. Finally, recourse to the exceptional clause of a severe downturn in the euro area or the EU could be made in order to justify slowing down the consolidation path and allowing for additional investment spending. All of this could further be supported if realistically high multiplier values were used in assessing the budgetary impact of additional investment, which may not be significantly negative or even positive. Reconsideration of the EU Commission’s method of cyclical adjustment – e.g. to be more in line with the OECD method and results – may create further leeway as it might increase the cyclical part of the budget deficit thus reducing the structural deficit (Truger 2015b).

Some or all of the mentioned interpretational leeway could be used to push up public investment to the level that would be consistent with a golden rule in the medium term. However, the permanent recourse to exceptional circumstances which would be necessary to permit permanent use of the rule for public investment in general would most probably overstretch the interpretational leeway inherent in the current framework. Therefore, in order to soundly implement the golden rule on the EU level a permanent change in the institutional fiscal framework would be adequate and most probably also necessary from a legal perspective.

Such a change could be adopted as primary law in the form of an ‘Investment Protocol’ that would be annexed to the Treaty under the simplified revisions procedure of Art. 48 of the Lisbon treaty (see Table 4). On the member states’ level further legal changes would be required if following the fiscal compact there were other legal provisions put in place that would prevent a reinterpretation of the budget balance as net of net spending on public investment.

#### **4.3. A European Investment Programme and an expansionary overall fiscal stance to spark off the recovery**

The implementation of the golden rule of investment would probably take some time, as the necessary political and legal steps cannot be completed overnight. The golden rule should therefore be seen mainly as a fiscal policy framework focused on safeguarding public investment in the medium term, and not so much as a readily available instrument for

providing the – urgently needed – boost to the European economy in the short run. As the Juncker-Plan will not be able to provide this boost in the short run – and most probably not even in the long run – the golden rule would have to be complemented by other forms of short-term fiscal stimulus.

As argued in the previous section the leeway inherent in the current institutional framework is sufficiently large to permit such a stimulus. Probably the most convincing way to do this would be to use the provision concerning a severe downturn in the euro area or the EU to justify a temporary deviation from the consolidation path, thus allowing for a substantial European Investment Programme (see table 4). The Commission has explicitly made a comparison with the 2008 European Economic Recovery Plan (European Commission 2008) to give an example of the potential use of this provision (European Commission 2015b: 17). As a condition for the use of this provision it “should remain limited to exceptional, carefully circumscribed situations to minimise the risk of moral hazard.” (European Commission 2015b: 17). Actually, one may well argue that the euro area is right now in such an exceptional situation after years of recession and stagnation and low inflation while monetary policy is at the lower bound.

Such a European Investment Programme should provide an annual stimulus of at least one per cent of GDP for two or three years. One option for the direction of the programme would be to use it in order to start phasing in traditional net public investment up to the desired level after the final implementation of the golden rule. Alternatively or additionally such a programme could also be used to allow for investment needs beyond the narrow national accounts definition to contribute to public investment in a broader sense.<sup>3</sup> Such a direction would meet concerns that the golden rule alone would only promote traditional tangible investment and neglect other important forms of investment in the economic sense of the word. This could be investment in education, including child care, but it could more generally focus on spending with a view to achieving the currently neglected Europe 2020 goals such as social inclusion or other areas that have strongly suffered from austerity in recent years. Last but not least the fiscal stimulus provided should not be thwarted by cutting other public expenditure. Instead, the leeway within the current institutions should be actively used to provide a substantial fiscal stimulus to the European Economy.

---

<sup>3</sup> Aiginger (2014) has made a similar proposal which he called the ‘silver rule’ proposal. Whereas the golden rule allows permanent debt financing of all net investment, the silver rule allows temporary debt financing of additional investment.

**Table 4: 10 opportunities to strengthen investment and facilitate an expansionary overall fiscal policy stance in Europe**

goals	measures
<b>short term (use interpretational leeway within present framework to come close to the golden rule of public investment)</b>	
<b>strengthening investment</b> + <b>expansionary overall fiscal policy stance</b>	(1) more active use of the ‘investment clause’
	(2) allow for temporary investment programmes (analogous to EFSI)
	(3) interpret temporary investment programmes as structural reforms
	(4) incorporate realistic investment multiplier in budgetary analysis ex ante
	(5) use leeway in economically bad times
	(6) implement better methods of cyclical adjustment
	(7) temporarily higher spending with a view to Europe 2020 goals
	(8) use exception for severe downturn in EU or euro area
<b>medium term (solid implementation of the golden rule of public investment)</b>	
<b>EU implementation</b>	(9) ‘investment protocol’ as annex to the Treaty (simplified revisions procedure Art. 48)
<b>national implementation</b>	(10) change national legislation to allow deduction of net public investment from deficit where necessary

Source: Truger (2015a).

## **5. Opportunities and limits of the golden rule in practice: Some multiplier-based simulations**

The golden rule is obviously an economically rational reform option for the euro area's current dysfunctional institutional framework. However, it is not entirely obvious what the macroeconomic consequences of its implementation would be. Would it be able to spark of a self-sustaining recovery in the euro area if implemented soon? Would it have avoided the austerity crisis? In order to address these questions in the following sections the results of some pragmatic multiplier-based simulations will be shown. The simulations are not meant to be completely realistic or comprehensive as they are not based on a sophisticated macroeconomic model of the euro area. Instead they present some cautious plausible multiplier-based raw estimates of what the macroeconomic consequences of the golden rule would have been in the past or could be in the future and whether supplementary measures are needed.

### **5.1. Simulation strategy and methodological remarks**

In what follows the results of two simulations will be presented. First, an ex-post-simulation will be run about what would have been the macroeconomic effects until 2015, had the golden rule been in place since the onset of austerity policies in the year 2010 (section 5.2). Second, the effects of implementing the golden rule from 2016 onwards until 2020 will be simulated. The simulations focus on real GDP, real GDP-growth, the government deficit and the government debt-to-GDP-ratio.

In the first step the feasible government investment stimulus under the golden rule – restricted to 1.5 % of GDP for sustainability reasons – compared to the baseline scenario (actual development of net public investment 2009-2015 in the ex-post-simulation and its projected development based on (extrapolations of) the national stability programmes from 2015 to 2020) is determined. In the second step this stimulus is multiplied with the government investment multiplier. This in turn is determined by a 30% addition to the standard fiscal (expenditure) multiplier. For the sake of convenience and in order to have some theoretical basis, the latter ( $dY/dG$ ) is calculated in a simple Keynesian income-expenditure model with a proportional income tax ( $t$ ) and income dependent imports with the marginal propensity to import ( $m$ ) and the standard marginal propensity to consume ( $c$ ). The multiplier is then determined by  $\frac{dY}{dG} = \frac{1}{1-c(1-t)+m}$ . Using the private households' gross savings rate as proxy



for (1-c), the government revenue-to-GDP-ratio for  $t$  and the import-to-GDP-ratio for  $m$  yields the multiplier values shown in table 5 for the 12 individual euro area countries.

**Table 5: Multiplier values for general government spending and investment for the 12 euro area countries used in the simulations**

	public expenditure	public investment
<b>Belgium</b>	0.72	0.94
<b>Germany</b>	1.07	1.39
<b>Ireland</b>	0.82	1.06
<b>Greece</b>	1.24	1.61
<b>Spain</b>	1.40	1.82
<b>France</b>	1.11	1.45
<b>Italy</b>	1.25	1.62
<b>Luxembourg</b>	0.44	0.58
<b>Netherlands</b>	0.79	1.03
<b>Austria</b>	0.93	1.21
<b>Portugal</b>	1.16	1.51
<b>Finland</b>	0.98	1.27

Source: European Commission 2016a; author's calculations.

The differences in the multipliers are mainly determined by the different import-to-GDP-ratios and are in the range of 0.44 for Luxemburg and 1.4 for Spain for the standard multiplier and 0.58 and 1.82 for the investment multiplier, which seems plausible, and indeed rather cautious, given the recent empirical multiplier estimates referred to in section 3.3.

The first-round effect of the fiscal impulses is then calculated by multiplying the fiscal impulse by the relevant multiplier leading to a corresponding increase in real GDP. This in turn leads to an improvement in the general government budget balance according to the country-specific budgetary semi-elasticities (Mourre et al. 2014). Depending on the specific multiplier value, public investment spending is self-financing to a considerable degree. Whether the self-financing effects open up additional fiscal leeway depends on whether they are interpreted as cyclical or as structural. According to the pro-cyclical method of cyclical adjustment by the European Commission (Truger 2015b and 2015c) a substantial part of the improvement would be interpreted as structural, so that it could be used for further fiscal stimulus. This in turn starts an additional expansionary process. In order to simulate the revisions of the potential growth estimates the resulting time-series for the real GDP values from 1991 onwards were filtered with the modified Hodrick-Prescott-Filter (mHP-Filter) used by the Swiss administration for the Swiss debt brake (see Bruchez 2003).

This leads to second-round expansionary effects, which lead to an increase in GDP according to the standard fiscal multiplier, which in turn influences the (structural) budget balance. The interaction between countries due to increased mutual imports/exports is not covered which

means that the overall effects will most probably be biased to the downside. In order to add a degree of realism a small inflationary reaction was added by increasing the price level by 0.3 percentage points for every 1 percentage point increase in real GDP.

## 5.2. The golden rule in retrospect: Simulation results for the EMU-12 countries from 2010 to 2015

For the calculation of the fiscal impulses in the ex-post-simulations government net fixed investment as given in Table 6 was used. Under the assumption that all governments would either keep up their net government investment at a minimum of 1.5 percent of GDP, or increase it in a stepwise manner<sup>4</sup> until the 1.5 percent of GDP-limit would be reached, investment stimuli according to the left-hand column of Figure 3 would be realised.

**Table 6: Government net fixed investment (ESA 2010) for the Euro-12 countries 2009-2015, in % of GDP**

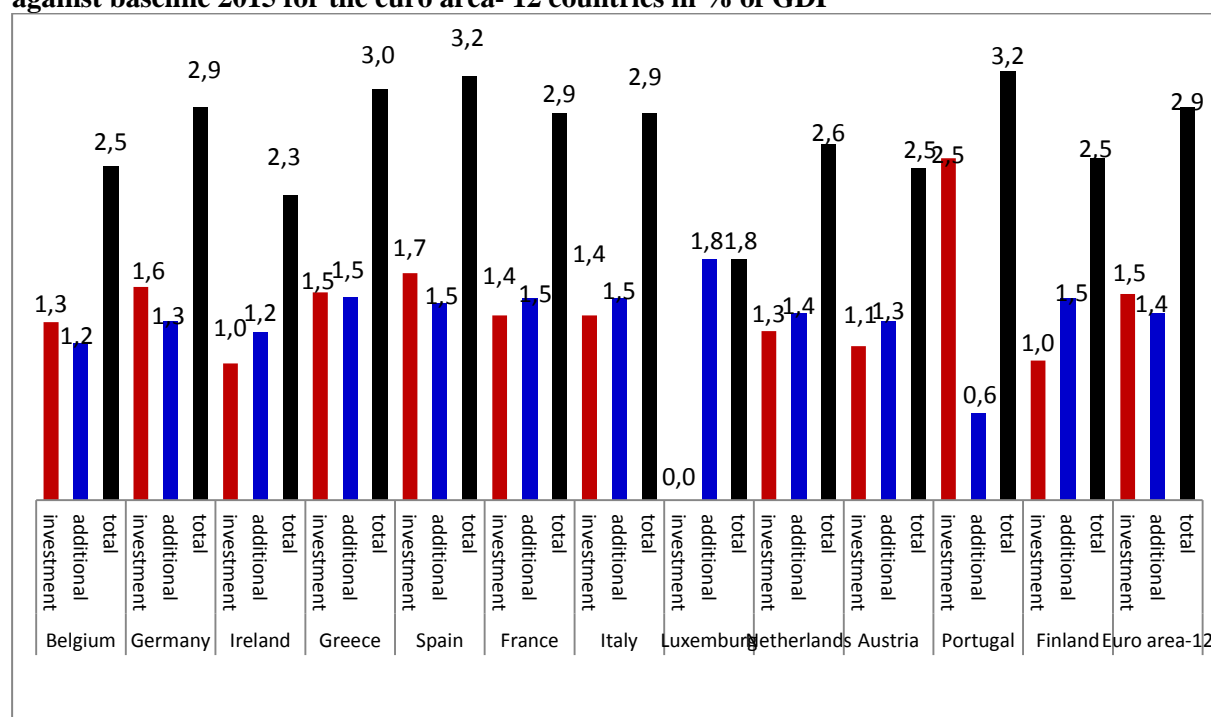
	2009	2010	2011	2012	2013	2014	2015
<b>Euro area (12 countries)</b>	<b>0.9</b>	<b>0.7</b>	<b>0.4</b>	<b>0.1</b>	<b>0.0</b>	<b>-0.1</b>	<b>-0.1</b>
<b>Belgium</b>	0.1	0.1	0.2	0.2	0.1	0.1	0.1
<b>Germany</b>	0.1	0.1	0.1	0.0	0.0	-0.1	-0.2
<b>Ireland</b>	1.8	1.4	0.5	0.2	-0.1	0.1	0.5
<b>Greece</b>	2.4	0.2	-1.2	-1.2	-0.3	0.3	-0.1
<b>Spain</b>	2.8	2.2	1.1	-0.2	-0.5	-0.6	-0.3
<b>France</b>	0.9	0.7	0.5	0.6	0.5	0.2	0.1
<b>Italy</b>	0.8	0.2	0.2	-0.1	-0.4	-0.5	-0.4
<b>Luxembourg</b>	2.3	2.6	2.0	1.8	1.2	1.3	1.5
<b>Netherlands</b>	1.1	0.9	0.7	0.4	0.3	0.2	0.2
<b>Austria</b>	0.7	0.5	0.4	0.3	0.4	0.3	0.3
<b>Portugal</b>	1.4	2.5	0.6	-0.6	-0.8	-0.9	-1.2
<b>Finland</b>	0.6	0.4	0.5	0.5	0.6	0.6	0.4

Source: European Commission (2016a); author's calculations.

The resulting multiplier-based increase in GDP and – according to the mHP-Filter-simulations – also in potential GDP would then lead to a structural improvement of the budget balance which in turn would have been used for further fiscal expansion (see blue column in Figure 3). The induced additional fiscal leeway is substantial and for most countries almost as large as the initial investment stimulus. All in all the macroeconomic effects are quite impressive. Had the golden rule been in place before the economic and financial crisis hit, fiscal policy would have been less contractionary by 2.9 percent of GDP in the euro area as a whole (see black column in Figure 3) which would have increased all countries' macroeconomic performance substantially (see Figure 4 and Table A1 in the appendix).

<sup>4</sup> The stepwise approach is taken so as to not cause a sudden surge in investment demand which might lead to an increase in the public investment deflator.

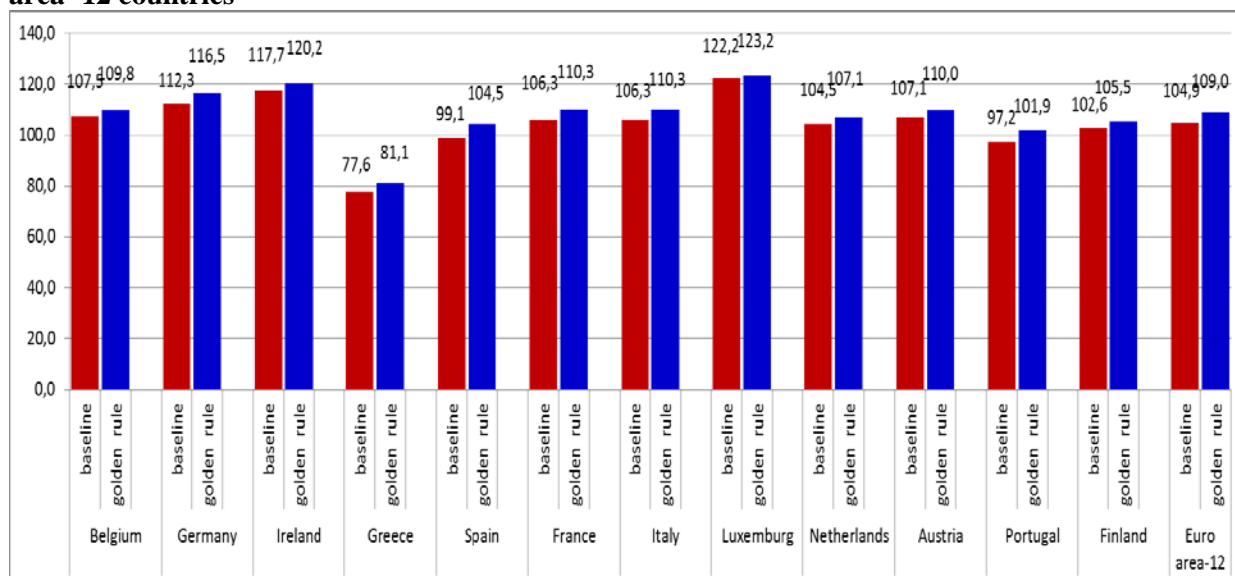
**Figure 3: Cumulative fiscal stance (investment, induced additional and total), golden rule against baseline 2015 for the euro area- 12 countries in % of GDP**



Source: European Commission (2016a); author's calculations.

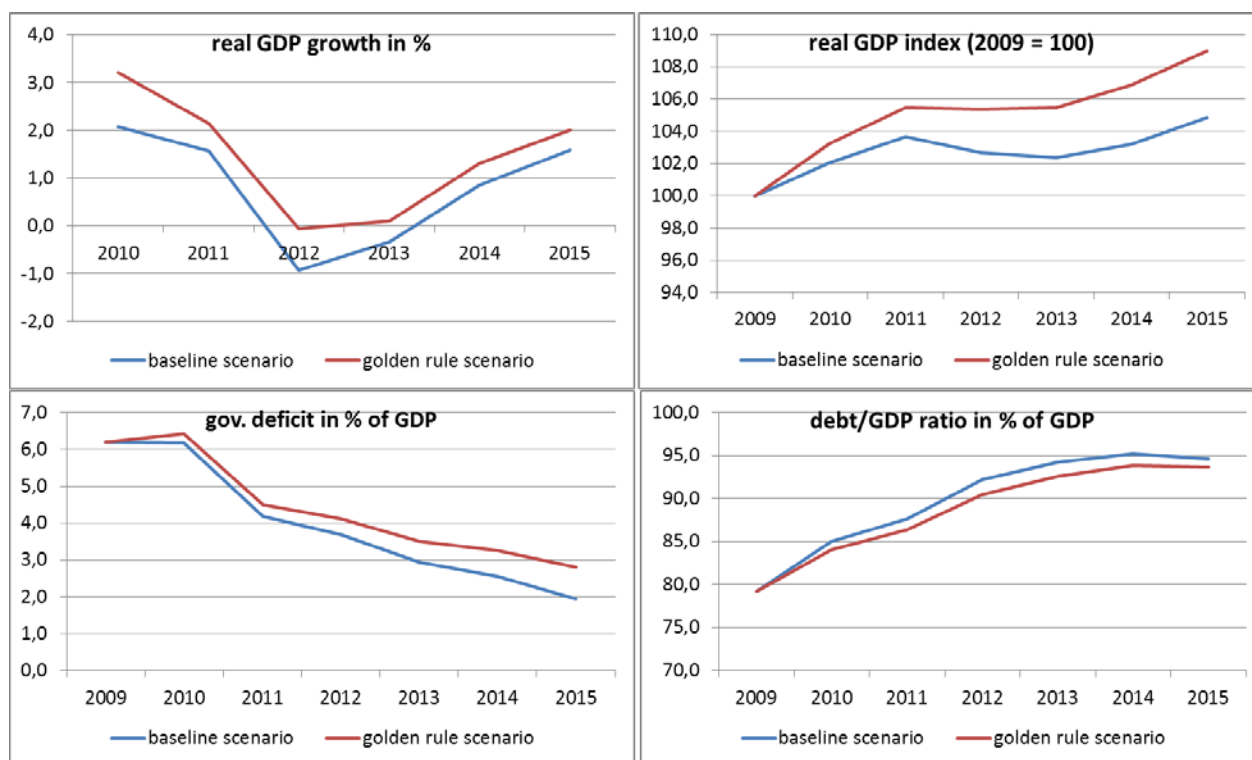
Real GDP would have been about 4 percent higher in 2015 for the euro area as a whole with individual country differences mainly explained by the size of the country-specific multipliers. For the euro area as a whole the improvement in macroeconomic performance would have been impressive. Despite the substantial stimulus of almost 3 percent of GDP the substantially higher GDP would have led to an only slightly higher deficit-to-GDP-ratio by about one percent, whereas the debt-to-GDP-level would even be substantially below the baseline scenario (Figure 5).

**Figure 4: Real GDP (2009 = 100) in 2015 for baseline and golden rule scenarios for the euro area- 12 countries**



Source: European Commission (2016a); author's calculations.

**Figure 5: Selected macroeconomic indicators for baseline and golden rule scenarios for the euro area- 12 average, 2009-2015.**



Source: European Commission (2016a); author's calculations.

All in all, substantial parts of the austerity packages' negative effects in the euro area could have been avoided (see Figures 4 and 5) had fiscal policy not been that austerity-driven and instead been driven by the golden rule. Table 7 relates the total fiscal stimulus through the

golden rule to the cumulative fiscal effort as of Table 1. For the euro area average about 50% of the austerity could have been avoided. Even if the positive aspects had been reinforced by the neglected interactions and synergies, therefore, the golden rule would probably not have prevented all of the austerity crisis, but certainly a substantial part of it.

**Table 7: Avoided relative austerity (total fiscal stimulus through golden rule relative to fiscal effort as of table 1) for the euro-12 countries 2009-2015, in %**

	2009	2010	2011	2012	2013	2014	2015
<b>Euro area (12 countries)</b>		651.1	95.1	57.0	50.7	51.9	55.7
<b>Belgium</b>		361.5	-	272.8	143.9	148.4	172.9
<b>Germany</b>		-	-	235.4	204.1	331.5	1092.4
<b>Ireland</b>		90.0	53.4	36.3	23.7	19.8	19.0
<b>Greece</b>		8.5	8.9	11.0	11.1	12.2	13.1
<b>Spain</b>		106.0	67.1	33.4	28.8	29.0	33.4
<b>France</b>		279.3	73.8	70.7	66.0	59.6	59.2
<b>Italy</b>		173.4	93.7	38.5	37.0	37.8	38.9
<b>Luxembourg</b>		-	188.0	76.3	52.0	52.1	82.8
<b>Netherlands</b>		927.0	157.4	74.6	45.3	43.1	38.3
<b>Austria</b>		-	137.6	101.4	81.4	85.7	82.9
<b>Portugal</b>		-	42.9	25.8	25.5	29.7	33.4
<b>Finland</b>		-	-	-	305.7	219.7	116.2

Source: Truger (2015b and 2015c); European Commission (2016a); author's calculations.

### **5.3. The golden rule in the current situation: Simulation results for the EMU-12 countries from 2016 to 2020**

For the calculation of the fiscal impulses in the ex-ante-simulations government net fixed investment as implied by countries' (extrapolation of) stability programmes given in Table 8 was used. Under the assumption that all governments would increase net investment in a stepwise manner<sup>5</sup> until the 1.5 percent of GDP-limit was reached, investment stimuli according to the left-hand column of Figure 6 would be realised. In the case governments in the baseline scenario already had positive net investment under the golden rule this increases their leeway for other expenditures.

The resulting multiplier-based increase in GDP and – according to the mHP-Filter-simulations – also in potential GDP would then lead to a structural improvement of the budget balance which in turn could be used for further fiscal expansion (see blue column in Figure 6). The induced additional fiscal leeway is substantial and for most countries almost as large as the initial investment stimulus. All in all the macroeconomic effects are quite impressive. Would the golden rule be operating from 2016 onwards, fiscal policy could be expansionary

<sup>5</sup> The stepwise approach is taken so as to not cause a sudden explosion of investment demand which may lead to an increase in the public investment deflator.

by 2.6 percent of GDP in the euro area as a whole (see black column in Figure 6) until 2020 which would increase all countries' macroeconomic performance substantially (see Figure 7 and Table A2 in the appendix).

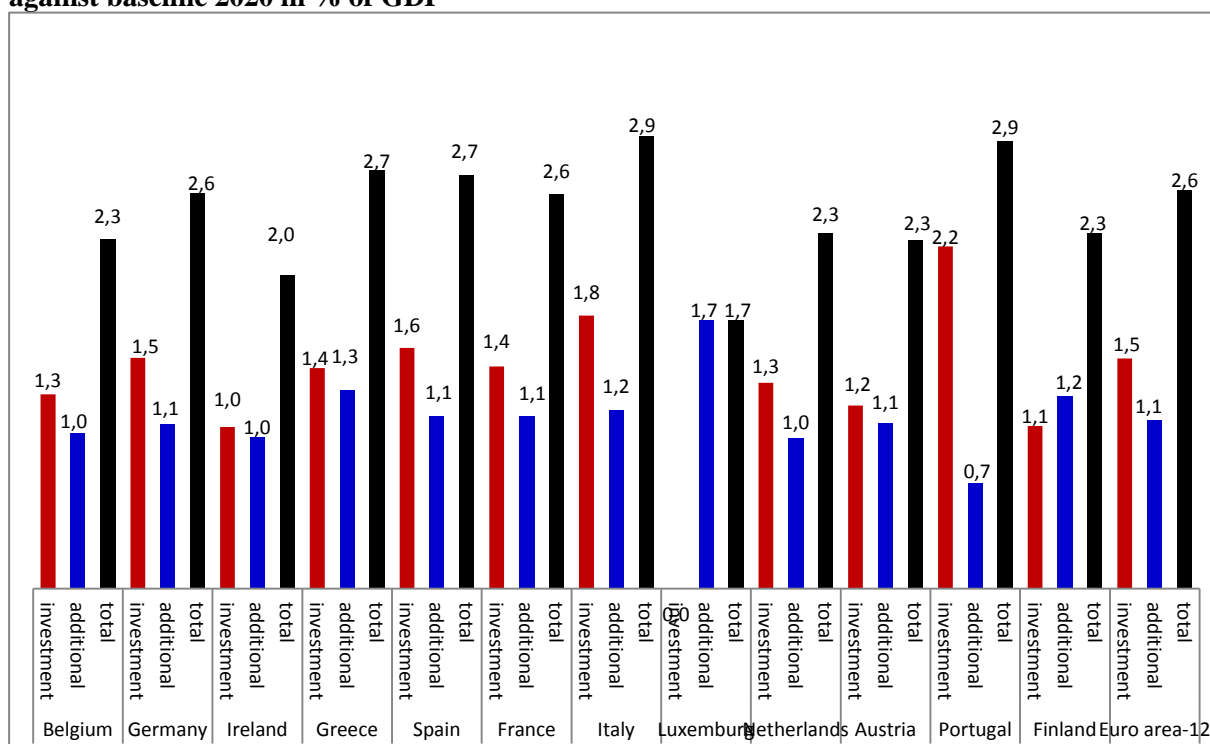
**Table 8: government net fixed investment (ESA 2010) for the Euro-12 countries 2015-2020, in % of GDP**

	2015	2016	2017	2018	2019	2020
<b>Euro area (12 countries)</b>	<b>-0.1</b>	<b>-0.1</b>	<b>-0.1</b>	<b>-0.1</b>	<b>-0.1</b>	<b>-0.1</b>
<b>Belgium</b>	0.1	0.1	0.3	0.2	0.2	0.2
<b>Germany</b>	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1
<b>Ireland</b>	0.5	0.4	0.5	0.5	0.4	0.4
<b>Greece</b>	-0.1	-0.2	0.0	0.0	0.0	0.0
<b>Spain</b>	-0.3	-0.4	-0.3	-0.2	-0.2	-0.1
<b>France</b>	0.1	0.1	0.0	0.0	0.0	0.0
<b>Italy</b>	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4
<b>Luxembourg</b>	1.5	1.6	1.7	1.8	1.8	1.7
<b>Netherlands</b>	0.2	0.1	0.1	0.1	0.1	0.1
<b>Austria</b>	0.3	0.3	0.3	0.3	0.3	0.3
<b>Portugal</b>	-1.2	-1.1	-1.0	-0.9	-0.9	-0.8
<b>Finland</b>	0.4	0.4	0.4	0.4	0.4	0.4

Source: European Commission (2016a) until 2017; European Commission (2016b) for 2018/2019; author's extrapolations for 2019/2020; author's calculations.

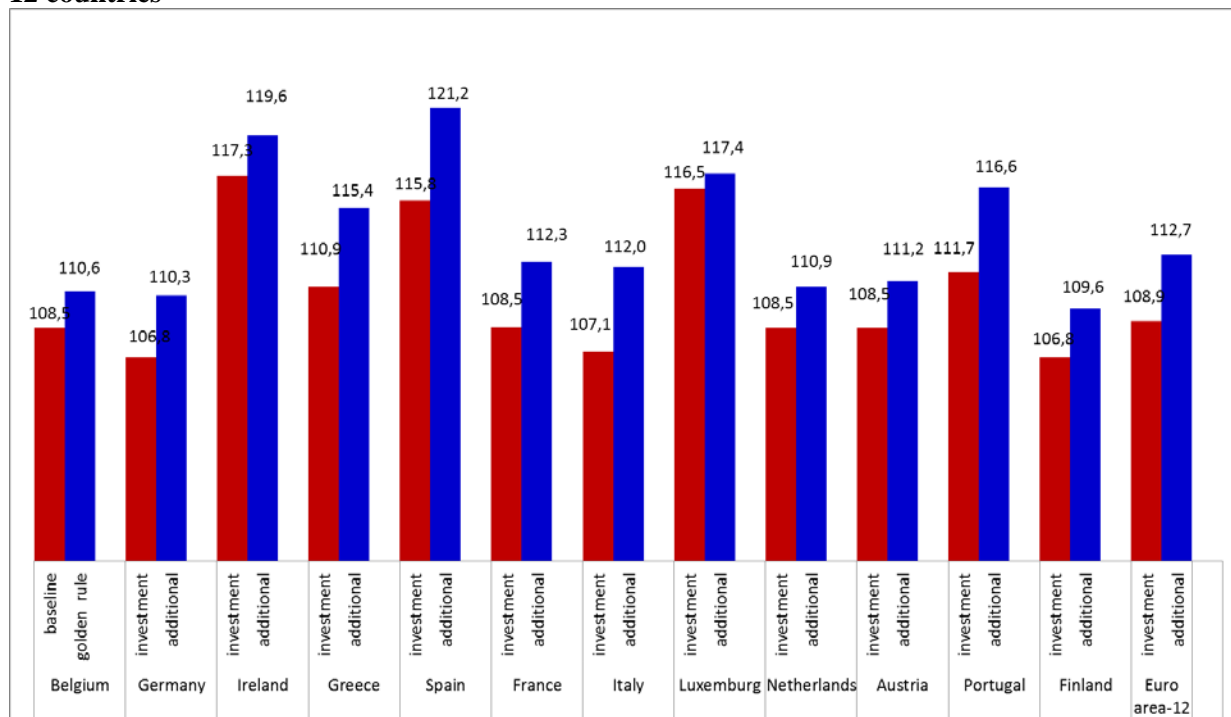
Real GDP would be almost 4 percent higher in 2020 for the euro area as a whole with individual country differences mainly explained by the size of the country-specific multipliers (see Figure 7). For the euro area as a whole the improvement in macroeconomic performance would be impressive. Despite the substantial stimulus of almost 3 percent of GDP the substantially higher GDP would lead to an only slightly higher deficit-to-GDP-ratio by less than one percent of GDP, whereas the debt-to-GDP-level would even be considerably below the baseline scenario (Figure 8).

**Figure 6: Cumulative fiscal stance (investment, induced additional and total), golden rule against baseline 2020 in % of GDP**



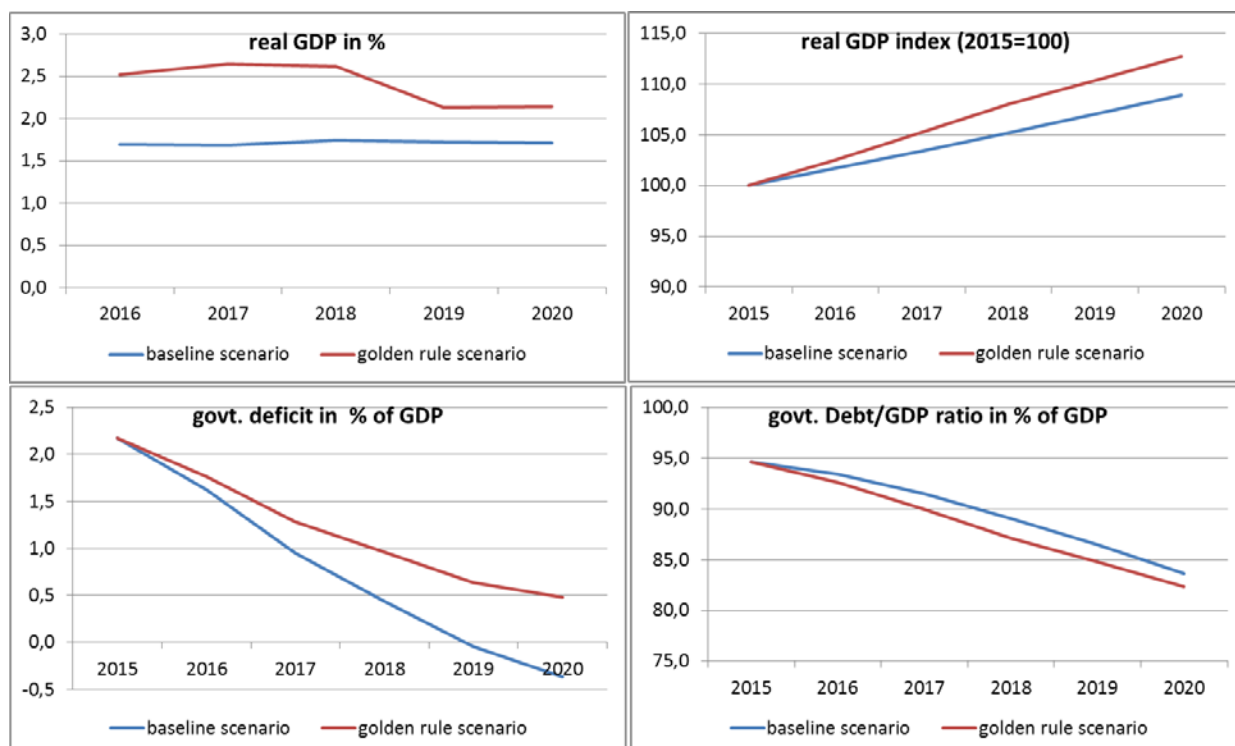
Source: European Commission (2016a); author's calculations.

**Figure 7: real GDP (2015 = 100) in 2020 for baseline and golden rule scenarios for the euro area-12 countries**



Source: European Commission (2016a); author's calculations.

**Figure 8: selected macroeconomic indicators for baseline and golden rule scenarios for the euro area- 12 average, 2015-2020.**



Source: European Commission (2016a); author's calculations.

Given the results of the cautious simulations it is plausible to assume that the implementation of the golden rule would be able to spark off a substantial recovery in the euro area as a whole.

## 6. Conclusion

Most parts of the euro area have seen eight years of deep economic crisis. Public investment which should have stabilised the economies and kept up their long-term growth potential has instead dramatically shrunk in the crisis-ridden countries of the periphery. Despite all efforts by the new European Commission and the ECB growth prospects have not improved since mid-2014 and public investment is not foreseen to recover substantially in the medium term future. Obviously, a change in the macroeconomic policy strategy is needed.

The golden rule of public investment proposed and discussed in this paper would be one important element of the necessary institutional reform. A pragmatic version focusing on net public investment as defined in the national accounts minus military expenditures plus investment grants for the private sector could quickly be implemented. This would at once protect public investment from cuts and provide leeway for investment to recover. Over time



the rule could be technically and statistically refined and potentially include other – more intangible types – of investment like education expenditures.

Despite all the limitations of the illustrative simulations conducted in this paper it seems safe to conclude that the golden rule would prove to be a substantial improvement of the EU fiscal framework as it would considerably improve macroeconomic performance without endangering fiscal sustainability. The potential power of the rule is most impressive in the current context in which its implementation followed by a stepwise increase of net public investment to 1.5 % in all euro area-12 member countries would spark-off a strong and probably self-sustaining recovery. In retrospect, the golden rule would still have fared impressively well since the financial and economic crisis. Given the huge extent of austerity the golden rule would not have been able to prevent all of the negative macroeconomic effects, but certainly a substantial part of it. Nevertheless, the golden rule would obviously need to be complemented by other measures to ensure macroeconomic stability over the cycle.

It should also be noted that through its partly self-financing nature the golden rule creates additional fiscal leeway that can be used for other purposes than government investment. That way the definition of government investment to be included in the golden rule becomes less crucial. Even if one has serious doubts about the rather narrow definition of public investment based on the national accounts – that was proposed for pragmatic reasons in this paper – the endogenous creation of further structural fiscal leeway will allow a strong increase also in those parts of government expenditure that are not directly privileged by the narrower definition of the golden rule.

It is therefore high time that the European institutions put the necessary institutional changes for the golden rule of public investment on the agenda. Its implementation would correct a major economic flaw of the current framework and reinstate a widely respected and powerful traditional guideline of public finance.

## References

- Aiginger, K. (2014): A silver bullet for restarting growth in Europe, EurActiv.com PLC, <http://www.euractiv.com/sections/euro-finance/silver-bullet-restarting-growth-europe-310912>.
- Arestis, P., Sawyer, M. (2003): Reinventing fiscal policy, in: *Journal of Post Keynesian Economics*, 26 (1): 3-25.
- Aschauer, David A. (1989): 'Is Public Expenditure Productive?' *Journal of Monetary Economics*, 23: 177-200.
- Auerbach, A. J., Gorodnichenko, Y. (2012): Fiscal Multipliers in Recession and Expansion. in: Alesina, A., Giavazzi, F. (eds), *Fiscal Policy after the Financial Crisis*, Chicago: University of Chicago Press (forthcoming).
- Barbiero, F., Darvas, Z. (2014): In *Sickness and in Health: Protecting and Supporting Public Investment in Europe*, Bruegel Policy Contribution 02/2014.
- Bauernschuster, S., Schlotter, M. (2015): Public child care and mothers' labor supply—Evidence from two quasi-experiments, *Journal of Public Economics* 123 (1): 1-16.
- Blanchard, O., Giavazzi, F. (2004): 'Improving the SGP through a proper accounting of public investment', CEPR Discussion Papers 4220.
- Bom, P., Ligthart, J. (2014): What Have We Learned From Three Decades of Research on the Productivity of Public Capital?, *Journal of Economic Surveys* 28 (5): 889-916.
- Bouthevillain, C. et al (2009): Pros and cons of various fiscal measures to stimulate the economy, *Banco de Espana Economic Bulletin*, July 2009, 123-144.
- Bruchez, P.-A. (2003): A Modification of the HP Filter Aiming at Reducing the End-Point Bias, Working Paper der EFV, Doc. No.: ÖT/2003/3, August.
- Card, D. (2001): Estimating the Return to Schooling: Progress on Some Persistent Econometric Problems, *Econometrica*, 69 (5): 1127-1160.
- Carnot, N., de Castro, F. (2015): The Discretionary Fiscal Effort: an Assessment of Fiscal Policy and its Output Effect, European Commission, Economic Papers no. 543, Brussels.
- Darvas, Z., Huettl, P., de Sousa, C., Terzi, A., Tschekassin, O. (2014): Austerity and Poverty in the European Union, Study for the Committee on Employment and Social Affairs of the European Parliament, Brussels.
- Dervis, K., Saraceno, F. (2014): An Investment New Deal for Europe, Brookings up front, 3 September, <http://www.brookings.edu/blogs/up-front/posts/2014/09/03-european-central-bank-dervis>.
- Dunn, M., Akritidis, L., Biedman, L. (2014): The impact of ESA 2010 on key indicators of the national accounts in Europe, *Eurostat Review on National Accounts and Macroeconomic Indicators*, 2/2014: 7-27.
- European Commission (2004): Public Finances in EMU 2004, European Economy No. 3, Brussels: European Commission, Directorate-General for Economic and Financial Affairs.
- European Commission (2008): Communication from the Commission from to the European Council: A European Economic Recovery Plan, Brussels, 26.11.2008 COM(2008) 800 final.
- European Commission (2012) Blueprint for deep and genuine Economic and Monetary Union – the launching a European debate, COM(2012) 777 final/2.
- European Commission (2013): Report on Public Finances in the EMU, European Economy No. 4, Brussels: European Commission, Directorate-General for Economic and Financial Affairs.
- European Commission (2015a): Annual macro-economic database (Ameco), February 2015.
- European Commission (2015b): Communication from the Commission to the European Parliament, the Council, the European Central Bank, the Economic and Social Committee, the Committee of the Regions and the European Investment Bank; Making the best use of the flexibility within the existing rules of the Stability and Growth Pact, Strasbourg, 13.1.2015 COM(2015) 12 final.
- European Commission (2016a): Annual macro-economic database (Ameco), February 2016.
- European Commission (2016b): European Semester 2015, Overview page about the 'country specific recommendations' and all related documents including the Stability Programmes Programmes for the Euro area countries, [http://ec.europa.eu/europe2020/making-it-happen/country-specific-recommendations/2015/index\\_en.htm](http://ec.europa.eu/europe2020/making-it-happen/country-specific-recommendations/2015/index_en.htm) (last access 10 March 2016).

- Ewerhart, G. (2002): Bildungsinvestitionen, brutto und netto – Eine makroökonomische Perspektive, in: Hartard, S. und C. Stahmer Magische Dreiecke – Berichte für eine nachhaltige Gesellschaft, Bd. 3: Sozio-ökonomische Berichtssysteme, Marburg: Metropolis: 217 - 246.
- Ewerhart, G. (2003): Ausreichende Bildungsinvestitionen in Deutschland? Bildungsinvestitionen und Bildungsvermögen in Deutschland 1992 - 1999, Beiträge zur Arbeitsmarkt- und Berufsforschung, Nr. 266, Nürnberg: Institut für Arbeitsmarkt- und Berufsforschung.
- Fitoussi, J.P., Creel, J. (2002): How to reform the European Central Bank?, London: Centre for European Reform.
- Gechert, S. (2015): What fiscal policy is most effective? A meta-regression analysis, Oxford Economic Papers 67 (3): 553-580.
- Gechert, S., Rannenberg, A. (2014): Are Fiscal Multipliers Regime-Dependent? A Meta Regression Analysis, IMK Working Paper No. 139, September, Düsseldorf: IMK in der Hans-Böckler-Stiftung.
- Girouard, N., C. André (2005) "Measuring Cyclically-Adjusted Budget Balances for OECD Countries." OECD Working Paper no. 434, Paris.
- Guajardo, J., Leigh, D., Pescatori, A. (2011): Expansionary Austerity: New International Evidence, International Monetary Fund, Working Paper WP/11/158, Washington D.C.
- Hemming, R., Kell, M. and Mahfouz, S. (2002): The Effectiveness of Fiscal Policy in Stimulating Economic Activity: A Review of the Literature, International Monetary Fund Working Paper No. 02/208, Washington D.C.
- IMF (2014): World Economic Outlook October 2014. Washington D.C.: International Monetary Fund.
- Lucas, R. (1988): On the mechanics of economic development, Journal of Monetary Economics, Vol.22 (1): 3-42.
- Melo, P., Graham, D., Brage-Ardao, R. (2013): The productivity of transport infrastructure investment: A meta-analysis of empirical evidence, Regional Science and Urban Economics, 43: 695-706.
- Mourre, G., Astarita, C., Princen, S. (2014): Adjusting the budget balance for the business cycle: the EU methodology, European Economy, Economic Papers No. 536, Brussels: EU Commission.
- Musgrave, R. A., (1939): The nature of budgetary balance and the case for a capital budget, American Economic Review, 29, 260-71.
- Musgrave R. A., (1959): The Theory of Public Finance. A Study in Public Economy, New York et al.: McGraw-Hill.
- Psacharopoulos, G. and Patrinos, H.A. (2004): Returns to Investment in Education. A Further Update, Education Economics, 12 (2): 111-134.
- Romp, W., De Haan (2005): Public Capital and Economic Growth: A Critical Survey, EIB Papers, 10: 40-71.
- SVR [Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung = German Council of Economic Experts] (2007): Staatsverschuldung wirksam begrenzen, Expertise im Auftrag des Bundesministers für Wirtschaft und Technologie, Wiesbaden.
- Truger, A. (2013): Austerity in the euro area: the sad state of economic policy in Germany and the EU, in: European Journal of Economics and Economic Policies, Intervention 2/2013: 158-174.
- Truger, A. (2015a): Implementing the Golden Rule for Public Investment in Europe – Safeguarding Public Investment and Supporting the Recovery, Working Paper-Reihe der AK Wien/Materialien zu Wirtschaft und Gesellschaft 138.
- Truger, A. (2015b): The Fiscal Compact, Cyclical Adjustment and the Remaining Leeway for Expansionary Fiscal Policies in the Euro Area, Panoeconomicus 62 (2) 2015: 157-175.
- Truger, A. (2015c): Austerity, cyclical adjustment and the remaining leeway for expansionary fiscal policies within the current European fiscal framework, in: Journal for a Progressive Economy, 6 July: 32-37.
- Truger, A. (2016): Towards a golden rule of public investment in Europe, in: Österreichische Nationalbank [OENB] (ed): Towards a Genuine Economic and Monetary Union, Proceedings of OENB Workshops No. 21, Vienna: OENB.
- Turrini, A. (2004): Public investment and the EU fiscal framework, European Economy -Economic Papers 202, Directorate General Economic and Monetary Affairs, European Commission

- Välilä, T., Mehrotra, A. (2005): Evolution and Determinants of Public Investment In Europe, EIB Papers, 10: 18-39.
- Veugeleers, R. (2014): Undercutting the future? European research spending in times of consolidation, Bruegel Policy Contribution 06/2014.

## Appendix: Macroeconomic indicators for the ex-ante and the ex post simulations of the golden rule

**Table A1: Macroeconomic indicators for the ex-post simulations: Baseline scenario and golden rule scenario 2009 to 2015**

Belgium								
		2009	2010	2011	2012	2013	2014	2015
		baseline scenario						
real GDP growth	in %		2.7	1.8	0.2	0.0	1.3	1.3
real_GDP_Index	in %	100.0	102.7	104.5	104.7	104.7	106.1	107.5
inflation rate	in %		1.9	2.0	2.0	1.3	0.7	0.4
government deficit	in % of GDP	5.4	4.0	4.1	4.1	2.9	3.1	2.6
govt.debt	in % of GDP	99.5	99.6	102.2	104.1	105.1	106.7	107.6
gross govt. Investment	in % of GDP	2.3	2.3	2.4	2.5	2.4	2.4	2.4
net govt. Investment	in % of GDP	0.1	0.1	0.2	0.2	0.1	0.1	0.1
		golden rule scenario (deviations from baseline)						
Net-Investment-Stance	in % of GDP		0.5	0.9	1.3	1.4	1.4	1.3
additional "structural" leeway	in % of GDP		0.1	0.3	0.5	0.6	0.9	1.2
total fiscal stance	in % of GDP		0.6	1.2	1.8	2.0	2.3	2.5
real GDP	in %		0.5	1.1	1.6	1.8	2.0	2.1
"potential"GDP	in %		0.1	0.3	0.7	1.2	1.6	2.0
GDP growth rate	in %-points		0.5	0.5	0.5	0.2	0.2	0.2
government budget deficit	in %-points		0.2	0.5	0.7	0.9	1.0	1.1
debt/GDP-ratio	in %-points		-0.4	-0.6	-0.5	0.1	0.9	1.8
cumulative inflation	in %-points		0.2	0.3	0.5	0.5	0.6	0.6
Germany								
		2009	2010	2011	2012	2013	2014	2015
		baseline scenario						
real GDP growth	in %		4.1	3.7	0.4	0.3	1.6	1.7
real_GDP_Index	in %	100.0	104.1	107.9	108.3	108.6	110.4	112.3
inflation rate	in %		0.8	1.1	1.5	2.1	1.7	2.0
government deficit	in % of GDP	3.2	4.2	1.0	0.1	0.1	-0.3	-0.9
govt.debt	in % of GDP	72.6	81.2	78.5	79.7	77.2	74.8	71.2
gross govt. Investment	in % of GDP	2.4	2.3	2.3	2.3	2.2	2.2	2.1
net govt. Investment	in % of GDP	0.1	0.1	0.1	0.0	0.0	-0.1	-0.2
		golden rule scenario (deviations from baseline)						
Net-Investment-Stance	in % of GDP		0.5	1.0	1.4	1.4	1.5	1.6
additional "structural" leeway	in % of GDP		0.1	0.3	0.5	0.8	1.1	1.3
total fiscal stance	in % of GDP		0.6	1.2	1.9	2.2	2.6	2.9
real GDP	in %		0.8	1.7	2.5	2.9	3.4	3.8
"potential"GDP	in %		0.1	0.5	1.2	1.9	2.6	3.3
GDP growth rate	in %-points		0.8	0.8	0.8	0.4	0.4	0.4
government budget deficit	in %-points		0.1	0.3	0.5	0.7	0.8	1.0
debt/GDP-ratio	in %-points		-0.7	-1.2	-1.6	-1.2	-0.8	-0.2
cumulative inflation	in %-points		0.3	0.5	0.8	0.9	1.0	1.1

**Table A1 (continued): Macroeconomic indicators for the ex-post simulations: Baseline scenario and golden rule scenario 2009 to 2015**

Ireland								
		2009	2010	2011	2012	2013	2014	2015
		baseline scenario						
real GDP growth	in %		0.4	2.6	0.2	1.4	5.2	6.9
real_GDP_Index	in %	100.0	100.4	103.0	103.2	104.6	110.1	117.7
inflation rate	in %		-2.3	2.0	0.4	1.2	0.1	3.4
government deficit	in % of GDP	13.8	32.3	12.5	8.0	5.7	3.9	2.1
govt.debt	in % of GDP	61.8	86.8	109.3	120.3	120.1	107.5	101.0
gross govt. Investment	in % of GDP	3.7	3.3	2.4	2.1	1.8	2.0	2.0
net govt. Investment	in % of GDP	1.8	1.4	0.5	0.2	-0.1	0.1	0.5
		golden rule scenario (deviations from baseline)						
Net-Investment-Stance	in % of GDP		0.0	1.0	1.3	1.5	1.4	1.0
additional "structural" leeway	in % of GDP		1.4	0.6	0.4	0.4	0.8	1.2
total fiscal stance	in % of GDP		1.4	1.6	1.8	2.0	2.1	2.3
real GDP	in %		1.2	1.6	1.8	2.0	2.1	2.1
"potential"GDP	in %		0.2	0.6	1.1	1.5	1.9	2.2
GDP growth rate	in %-points		1.2	0.4	0.2	0.2	0.1	0.0
government budget deficit	in %-points		0.5	0.7	0.9	1.0	1.2	1.4
debt/GDP-ratio	in %-points		-0.4	-0.3	0.2	0.9	2.2	3.3
cumulative inflation	in %-points		0.4	0.5	0.5	0.6	0.7	0.7
Greece								
		2009	2010	2011	2012	2013	2014	2015
		baseline scenario						
real GDP growth	in %		-5.5	-9.1	-7.3	-3.2	0.7	0.0
real_GDP_Index	in %	100.0	94.5	85.9	79.6	77.1	77.6	77.6
inflation rate	in %		0.9	0.6	0.0	-2.3	-2.6	-1.7
government deficit	in % of GDP	15.2	11.2	10.2	8.7	12.3	3.6	4.3
govt.debt	in % of GDP	126.7	145.7	171.2	156.9	175.1	177.5	183.4
gross govt. Investment	in % of GDP	5.7	3.7	2.4	2.5	3.4	3.9	3.5
net govt. Investment	in % of GDP	2.4	0.2	-1.2	-1.2	-0.3	0.3	-0.1
		golden rule scenario (deviations from baseline)						
Net-Investment-Stance	in % of GDP		0.4	2.1	2.6	1.8	1.2	1.5
additional "structural" leeway	in % of GDP		0.2	-0.9	-0.7	0.6	1.5	1.5
total fiscal stance	in % of GDP		0.6	1.2	1.9	2.3	2.7	3.0
real GDP	in %		0.9	2.4	3.5	3.7	4.0	4.6
"potential"GDP	in %		0.1	0.6	1.4	2.3	3.3	4.2
GDP growth rate	in %-points		0.9	1.4	1.1	0.2	0.2	0.6
government budget deficit	in %-points		0.0	-0.2	-0.1	0.0	0.7	0.7
debt/GDP-ratio	in %-points		-1.6	-4.7	-6.2	-6.8	-6.5	-7.3
cumulative inflation	in %-points		0.3	0.6	1.0	1.0	1.1	1.3

**Table A1 (continued): Macroeconomic indicators for the ex-post simulations: Baseline scenario and golden rule scenario 2009 to 2015**

Spain								
		2009	2010	2011	2012	2013	2014	2015
		baseline scenario						
real GDP growth	in %		0.0	-1.0	-2.6	-1.7	1.4	3.2
real_GDP_Index	in %	100.0	100.0	99.0	96.4	94.8	96.1	99.1
inflation rate	in %		0.2	0.0	0.0	0.6	-0.4	0.7
government deficit	in % of GDP	11.0	9.4	9.5	10.4	6.9	5.9	4.2
govt.debt	in % of GDP	52.7	60.1	69.5	85.4	93.7	99.3	100.5
gross govt. Investment	in % of GDP	5.1	4.7	3.7	2.5	2.2	2.1	2.3
net govt. Investment	in % of GDP	2.8	2.2	1.1	-0.2	-0.5	-0.6	-0.3
		golden rule scenario (deviations from baseline)						
Net-Investment-Stance	in % of GDP		0.0	0.3	1.6	1.9	1.9	1.7
additional "structural" leeway	in % of GDP		1.5	1.3	0.3	0.5	0.8	1.5
total fiscal stance	in % of GDP		1.5	1.6	2.0	2.4	2.8	3.2
real GDP	in %		2.1	2.5	3.6	4.3	5.0	5.5
"potential"GDP	in %		0.3	1.0	1.9	2.8	3.9	4.9
GDP growth rate	in %-points		2.1	0.4	1.0	0.8	0.6	0.4
government budget deficit	in %-points		0.3	0.3	0.0	0.2	0.4	0.7
debt/GDP-ratio	in %-points		-1.0	-1.0	-2.1	-2.7	-3.1	-2.9
cumulative inflation	in %-points		0.6	0.7	1.1	1.3	1.5	1.6
France								
		2009	2010	2011	2012	2013	2014	2015
		baseline scenario						
real GDP growth	in %		2.0	2.1	0.2	0.7	0.2	1.1
real_GDP_Index	in %	100.0	102.0	104.1	104.3	105.0	105.1	106.3
inflation rate	in %		1.1	0.9	1.2	0.8	0.6	1.1
government deficit	in % of GDP	7.2	6.8	5.1	4.8	4.1	3.9	3.8
govt.debt	in % of GDP	79.0	81.7	85.2	89.6	92.2	95.5	96.5
gross govt. Investment	in % of GDP	4.3	4.1	4.0	4.1	4.0	3.7	3.5
net govt. Investment	in % of GDP	0.9	0.7	0.5	0.6	0.5	0.2	0.1
		golden rule scenario (deviations from baseline)						
Net-Investment-Stance	in % of GDP		0.2	0.6	0.9	1.0	1.3	1.4
additional "structural" leeway	in % of GDP		0.8	0.7	0.9	1.2	1.3	1.5
total fiscal stance	in % of GDP		1.0	1.2	1.9	2.2	2.5	2.9
real GDP	in %		1.2	1.6	2.5	2.9	3.4	3.8
"potential"GDP	in %		0.2	0.6	1.2	1.9	2.6	3.3
GDP growth rate	in %-points		1.2	0.4	0.8	0.4	0.5	0.4
government budget deficit	in %-points		0.3	0.3	0.5	0.6	0.6	0.8
debt/GDP-ratio	in %-points		-0.9	-1.0	-1.4	-1.3	-1.2	-0.9
cumulative inflation	in %-points		0.4	0.5	0.7	0.9	1.0	1.1

**Table A1 (continued): Macroeconomic indicators for the ex-post simulations: Baseline scenario and golden rule scenario 2009 to 2015**

Italy								
		2009	2010	2011	2012	2013	2014	2015
		baseline scenario						
real GDP growth	in %		2.0	2.1	0.2	0.7	0.2	1.1
real_GDP_Index	in %	100.0	102.0	104.1	104.3	105.0	105.1	106.3
inflation rate	in %		1.1	0.9	1.2	0.8	0.6	1.1
government deficit	in % of GDP	7.2	6.8	5.1	4.8	4.1	3.9	3.8
govt.debt	in % of GDP	79.0	81.7	85.2	89.6	92.2	95.5	96.5
gross govt. Investment	in % of GDP	4.3	4.1	4.0	4.1	4.0	3.7	3.5
net govt. Investment	in % of GDP	0.9	0.7	0.5	0.6	0.5	0.2	0.1
		golden rule scenario (deviations from baseline)						
Net-Investment-Stance	in % of GDP		0.2	0.6	0.9	1.0	1.3	1.4
additional "structural" leeway	in % of GDP		0.8	0.7	0.9	1.2	1.3	1.5
total fiscal stance	in % of GDP		1.0	1.2	1.9	2.2	2.5	2.9
real GDP	in %		1.2	1.6	2.5	2.9	3.4	3.8
"potential"GDP	in %		0.2	0.6	1.2	1.9	2.6	3.3
GDP growth rate	in %-points		1.2	0.4	0.8	0.4	0.5	0.4
government budget deficit	in %-points		0.3	0.3	0.5	0.6	0.6	0.8
debt/GDP-ratio	in %-points		-0.9	-1.0	-1.4	-1.3	-1.2	-0.9
cumulative inflation	in %-points		0.4	0.5	0.7	0.9	1.0	1.1
Luxemburg								
		2009	2010	2011	2012	2013	2014	2015
		baseline scenario						
real GDP growth	in %		5.7	2.6	-0.8	4.3	4.1	4.7
real_GDP_Index	in %	100.0	105.7	108.4	107.5	112.1	116.7	122.2
inflation rate	in %		3.1	4.2	4.0	2.4	0.9	3.3
government deficit	in % of GDP	0.5	0.5	-0.5	-0.2	-0.7	-1.4	-0.9
govt.debt	in % of GDP	15.4	19.6	19.2	22.1	23.4	23.0	24.9
gross govt. Investment	in % of GDP	4.3	4.6	4.2	4.1	3.5	3.5	3.7
net govt. Investment	in % of GDP	2.3	2.6	2.0	1.8	1.2	1.3	1.5
		golden rule scenario (deviations from baseline)						
Net-Investment-Stance	in % of GDP		0.0	0.0	0.0	0.0	0.0	0.0
additional "structural" leeway	in % of GDP		1.5	1.5	1.6	1.4	1.5	1.8
total fiscal stance	in % of GDP		1.5	1.5	1.6	1.4	1.5	1.8
real GDP	in %		0.7	0.7	0.7	0.6	0.7	0.8
"potential"GDP	in %		0.1	0.3	0.5	0.6	0.7	0.8
GDP growth rate	in %-points		0.7	0.0	0.0	-0.1	0.0	0.1
government budget deficit	in %-points		1.2	1.2	1.3	1.1	1.2	1.4
debt/GDP-ratio	in %-points		1.0	2.2	3.4	4.3	5.3	6.3
cumulative inflation	in %-points		0.2	0.2	0.2	0.2	0.2	0.2



**Table A1 (continued): Macroeconomic indicators for the ex-post simulations: Baseline scenario and golden rule scenario 2009 to 2015**

Netherlands								
		2009	2010	2011	2012	2013	2014	2015
		baseline scenario						
real GDP growth	in %		1.4	1.7	-1.1	-0.5	1.0	2.0
real_GDP_Index	in %	100.0	101.4	103.1	102.0	101.5	102.5	104.5
inflation rate	in %		0.9	0.1	1.4	1.3	0.8	0.3
government deficit	in % of GDP	5.4	5.0	4.3	3.9	2.4	2.4	2.0
govt.debt	in % of GDP	56.5	59.0	61.7	66.5	67.9	68.2	68.1
gross govt. Investment	in % of GDP	4.3	4.1	4.0	3.7	3.6	3.5	3.4
net govt. Investment	in % of GDP	1.1	0.9	0.7	0.4	0.3	0.2	0.2
		golden rule scenario (deviations from baseline)						
Net-Investment-Stance	in % of GDP		0.6	0.6	1.1	1.2	1.3	1.3
additional "structural" leeway	in % of GDP		0.9	0.9	0.8	1.0	1.1	1.4
total fiscal stance	in % of GDP		1.5	1.5	1.9	2.2	2.4	2.6
real GDP	in %		1.4	1.4	1.8	2.1	2.3	2.5
"potential"GDP	in %		0.2	0.6	1.1	1.5	2.0	2.3
GDP growth rate	in %-points		1.4	0.0	0.4	0.3	0.2	0.2
government budget deficit	in %-points		0.6	0.7	0.8	0.9	1.1	1.2
debt/GDP-ratio	in %-points		-0.3	0.4	0.8	1.5	2.4	3.4
cumulative inflation	in %-points		0.4	0.4	0.5	0.6	0.7	0.7
Austria								
		2009	2010	2011	2012	2013	2014	2015
		baseline scenario						
real GDP growth	in %		1.9	2.8	0.8	0.3	0.4	0.7
real_GDP_Index	in %	100.0	101.9	104.8	105.6	105.9	106.3	107.1
inflation rate	in %		1.0	1.9	1.9	1.5	1.6	1.4
government deficit	in % of GDP	4.1	4.7	3.4	2.6	1.4	2.1	1.9
govt.debt	in % of GDP	79.7	82.5	82.2	81.7	80.8	84.2	84.7
gross govt. Investment	in % of GDP	3.4	3.2	3.0	2.9	3.0	3.0	2.9
net govt. Investment	in % of GDP	0.7	0.5	0.4	0.3	0.4	0.3	0.3
		golden rule scenario (deviations from baseline)						
Net-Investment-Stance	in % of GDP		0.3	0.7	1.2	1.1	1.1	1.1
additional "structural" leeway	in % of GDP		0.5	0.5	0.6	0.9	1.1	1.3
total fiscal stance	in % of GDP		0.9	1.2	1.8	2.0	2.3	2.5
real GDP	in %		0.9	1.3	2.0	2.2	2.5	2.7
"potential"GDP	in %		0.2	0.5	1.0	1.5	2.0	2.5
GDP growth rate	in %-points		0.9	0.4	0.7	0.2	0.2	0.2
government budget deficit	in %-points		0.4	0.5	0.8	0.9	1.0	1.1
debt/GDP-ratio	in %-points		-0.5	-0.4	-0.4	0.4	1.1	2.0
cumulative inflation	in %-points		0.3	0.4	0.6	0.7	0.7	0.8

**Table A1 (continued): Macroeconomic indicators for the ex-post simulations: Baseline scenario and golden rule scenario 2009 to 2015**

Portugal								
		2009	2010	2011	2012	2013	2014	2015
		baseline scenario						
real GDP growth	in %		1.9	-1.8	-4.0	-1.1	0.9	1.5
real_GDP_Index	in %	100.0	101.9	100.0	96.0	94.9	95.8	97.2
inflation rate	in %		0.6	-0.3	-0.4	2.3	1.0	1.4
government deficit	in % of GDP	9.8	11.2	7.4	5.7	4.8	7.2	3.0
govt.debt	in % of GDP	83.6	96.2	111.4	126.2	129.0	130.2	128.2
gross govt. Investment	in % of GDP	4.1	5.3	3.5	2.5	2.2	2.0	2.1
net govt. Investment	in % of GDP	1.4	2.5	0.6	-0.6	-0.8	-0.9	-1.2
		golden rule scenario (deviations from baseline)						
Net-Investment-Stance	in % of GDP		0.0	0.9	2.0	2.2	2.3	2.5
additional "structural" leeway	in % of GDP		1.5	0.7	0.0	0.2	0.5	0.6
total fiscal stance	in % of GDP		1.5	1.7	2.0	2.4	2.8	3.2
real GDP	in %		1.7	2.3	3.1	3.8	4.3	4.9
"potential"GDP	in %		0.3	0.9	1.7	2.6	3.5	4.3
GDP growth rate	in %-points		1.7	0.6	0.8	0.6	0.5	0.5
government budget deficit	in %-points		0.4	0.4	0.3	0.5	0.5	0.8
debt/GDP-ratio	in %-points		-1.5	-2.0	-3.1	-3.5	-3.6	-3.5
cumulative inflation	in %-points		0.5	0.7	0.9	1.1	1.3	1.4
Finland								
		2009	2010	2011	2012	2013	2014	2015
		baseline scenario						
real GDP growth	in %		3.0	2.6	-1.4	-1.1	-0.4	0.0
real_GDP_Index	in %	100.0	103.0	105.6	104.1	103.0	102.5	102.6
inflation rate	in %		0.4	2.6	3.0	2.6	1.6	0.2
government deficit	in % of GDP	2.5	2.6	1.0	2.1	2.5	3.3	3.3
govt.debt	in % of GDP	41.7	47.1	48.5	52.9	55.6	59.3	60.6
gross govt. Investment	in % of GDP	4.0	3.7	3.8	4.0	4.1	4.1	3.9
net govt. Investment	in % of GDP	0.6	0.4	0.5	0.5	0.6	0.6	0.4
		golden rule scenario (deviations from baseline)						
Net-Investment-Stance	in % of GDP		0.4	1.0	0.9	0.9	0.9	1.0
additional "structural" leeway	in % of GDP		0.4	0.6	0.9	1.2	1.4	1.5
total fiscal stance	in % of GDP		0.8	1.6	1.8	2.1	2.3	2.5
real GDP	in %		1.0	1.9	2.1	2.3	2.6	2.9
"potential"GDP	in %		0.2	0.6	1.1	1.7	2.2	2.7
GDP growth rate	in %-points		1.0	0.9	0.2	0.2	0.2	0.3
government budget deficit	in %-points		0.3	0.7	0.8	0.9	1.0	1.1
debt/GDP-ratio	in %-points		-0.2	-0.1	0.5	1.2	2.0	2.9
cumulative inflation	in %-points		0.3	0.6	0.6	0.7	0.8	0.9

Euro area (12 countries)								
		2009	2010	2011	2012	2013	2014	2015
		baseline scenario						
real GDP growth	in %		2.1	1.6	-0.9	-0.3	0.8	1.6
real_GDP_Index	in %	100.0	102.1	103.7	102.7	102.4	103.2	104.9
inflation rate	in %		0.7	1.0	1.2	1.3	0.9	1.1
government deficit	in % of GDP	6.2	6.2	4.2	3.7	2.9	2.6	1.9
govt.debt	in % of GDP	79.2	85.0	87.6	92.2	94.2	95.3	94.7
gross govt. Investment	in % of GDP	3.6	3.4	3.1	2.9	2.8	2.7	2.6
net govt. Investment	in % of GDP	0.9	0.7	0.4	0.1	0.0	-0.1	-0.1
		golden rule scenario (deviations from baseline)						
Net-Investment-Stance	in % of GDP		0.3	0.8	1.3	1.4	1.5	1.5
additional "structural" leeway	in % of GDP		0.6	0.5	0.5	0.8	1.1	1.4
total fiscal stance	in % of GDP		0.9	1.3	1.9	2.2	2.6	2.9
real GDP	in %		1.1	1.7	2.6	3.1	3.5	4.0
"potential"GDP	in %		0.2	0.6	1.3	2.0	2.8	3.5
GDP growth rate	in %-points		1.1	0.6	0.9	0.4	0.5	0.4
government budget deficit	in %-points		0.2	0.3	0.4	0.6	0.7	0.9
debt/GDP-ratio	in %-points		-0.9	-1.2	-1.7	-1.6	-1.4	-1.0
cumulative inflation	in %-points		0.3	0.5	0.8	0.9	1.0	1.2

Source: European Commission (2016a); national stability programmes as of European Commission (2016b); author's calculations.

**Table A2: Macroeconomic indicators for the ex-ante simulations: Baseline scenario and golden rule scenario 2015 to 2020**

Belgium							
		2015	2016	2017	2018	2019	2020
		baseline scenario					
real GDP growth	in %		1.5	1.6	1.7	1.7	1.7
real_GDP_Index	in %	100.0	101.5	103.1	104.9	106.7	108.5
inflation rate	in %		0.9	1.2	1.3	1.4	1.5
government deficit	in % of GDP	2.5	2.0	1.0	0.2	0.0	-0.2
govt.debt	in % of GDP	106.9	106.3	104.6	102.0	99.5	97.0
gross govt. Investment	in % of GDP	2.3	2.3	2.3	2.3	2.3	2.3
net govt. Investment	in % of GDP	0.1	0.1	0.3	0.2	0.2	0.2
		golden rule scenario (deviations from baseline)					
Net-Investment-Stance	in % of GDP		0.5	0.9	1.3	1.3	1.3
additional "structural" leeway	in % of GDP		0.1	0.4	0.5	0.8	1.0
total fiscal stance	in % of GDP		0.6	1.2	1.8	2.0	2.3
real GDP	in %		0.5	1.1	1.6	1.8	2.0
"potential"GDP	in %		0.1	0.3	0.7	1.2	1.6
GDP growth rate	in %-points		0.5	0.6	0.5	0.2	0.2
government budget deficit	in %-points		0.3	0.6	0.8	1.0	1.1
debt/GDP-ratio	in %-points		-0.5	-0.6	-0.4	0.3	1.2
cumulative inflation	in %-points		0.2	0.3	0.5	0.5	0.6
Germany							
		2015	2016	2017	2018	2019	2020
		baseline scenario					
real GDP growth	in %		1.6	1.3	1.3	1.3	1.3
real_GDP_Index	in %	100.0	101.6	102.9	104.2	105.5	106.8
inflation rate	in %		1.7	2.0	2.0	2.0	2.0
government deficit	in % of GDP	-0.3	0.0	-0.3	-0.3	-0.5	-0.5
govt.debt	in % of GDP	71.5	68.8	66.0	63.8	61.5	59.5
gross govt. Investment	in % of GDP	2.2	2.3	2.3	2.2	2.2	2.2
net govt. Investment	in % of GDP	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1
		golden rule scenario (deviations from baseline)					
Net-Investment-Stance	in % of GDP		0.5	1.0	1.5	1.5	1.5
additional "structural" leeway	in % of GDP		0.0	0.2	0.4	0.7	1.1
total fiscal stance	in % of GDP		0.5	1.2	1.9	2.2	2.6
real GDP	in %		0.7	1.6	2.6	2.9	3.3
"potential"GDP	in %		0.1	0.5	1.1	1.9	2.6
GDP growth rate	in %-points		0.8	0.9	0.9	0.4	0.4
government budget deficit	in %-points		0.1	0.3	0.5	0.7	0.8
debt/GDP-ratio	in %-points		-0.5	-1.0	-1.1	-0.7	-0.2
cumulative inflation	in %-points		0.2	0.5	0.8	0.9	1.0

**Table A2 (continued): Macroeconomic indicators for the ex-ante simulations: Baseline scenario and golden rule scenario 2015 to 2020**

Ireland							
		2015	2016	2017	2018	2019	2020
		baseline scenario					
real GDP growth	in %		3.8	3.2	3.2	3.0	3.0
real_GDP_Index	in %	100.0	103.8	107.1	110.5	113.9	117.3
inflation rate	in %		1.5	1.0	1.2	1.2	1.2
government deficit	in % of GDP	2.3	1.7	0.9	0.1	-0.7	-1.7
govt.debt	in % of GDP	105.0	100.3	97.8	93.6	89.4	84.7
gross govt. Investment	in % of GDP	1.8	1.8	1.6	1.6	1.6	1.5
net govt. Investment	in % of GDP	0.5	0.4	0.5	0.5	0.4	0.4
		golden rule scenario (deviations from baseline)					
Net-Investment-Stance	in % of GDP		0.4	0.7	1.0	1.0	1.0
additional "structural" leeway	in % of GDP		0.4	0.6	0.7	0.8	1.0
total fiscal stance	in % of GDP		0.8	1.3	1.7	1.9	2.0
real GDP	in %		0.7	1.2	1.7	1.8	2.0
"potential"GDP	in %		0.1	0.4	0.9	1.3	1.7
GDP growth rate	in %-points		0.7	0.5	0.5	0.2	0.1
government budget deficit	in %-points		0.5	0.8	1.0	1.2	1.3
debt/GDP-ratio	in %-points		-0.5	-0.3	0.2	1.2	2.3
cumulative inflation	in %-points		0.2	0.4	0.5	0.6	0.6
Greece							
		2015	2016	2017	2018	2019	2020
		baseline scenario					
real GDP growth	in %		-1.3	2.7	3.1	3.0	3.0
real_GDP_Index	in %	100.0	98.7	101.4	104.5	107.6	110.9
inflation rate	in %		1.7	2.0	2.0	2.0	2.0
government deficit	in % of GDP	7.6	3.4	2.3	0.6	0.0	0.0
govt.debt	in % of GDP	196.3	200.9	198.6	190.7	182.3	174.5
gross govt. Investment	in % of GDP	3.5	3.4	3.5	3.5	3.5	3.5
net govt. Investment	in % of GDP	-0.1	-0.2	0.0	0.0	0.0	0.0
		golden rule scenario (deviations from baseline)					
Net-Investment-Stance	in % of GDP		0.6	1.0	1.4	1.4	1.4
additional "structural" leeway	in % of GDP		0.0	0.2	0.5	0.9	1.3
total fiscal stance	in % of GDP		0.6	1.2	1.9	2.3	2.7
real GDP	in %		0.9	2.0	3.0	3.5	4.1
"potential"GDP	in %		0.2	0.6	1.5	2.4	3.4
GDP growth rate	in %-points		0.9	1.1	1.1	0.5	0.5
government budget deficit	in %-points		0.1	0.2	0.5	0.6	0.8
debt/GDP-ratio	in %-points		-2.2	-4.5	-6.4	-6.6	-6.7
cumulative inflation	in %-points		0.3	0.6	0.9	1.1	1.2

**Table A2 (continued): Macroeconomic indicators for the ex-ante simulations: Baseline scenario and golden rule scenario 2015 to 2020**

Spain							
		2015	2016	2017	2018	2019	2020
		baseline scenario					
real GDP growth	in %		2.9	3.0	3.0	3.0	3.0
real_GDP_Index	in %	100.0	102.9	106.0	109.2	112.4	115.8
inflation rate	in %		0.9	1.2	1.6	1.8	1.8
government deficit	in % of GDP	4.2	2.8	1.4	0.3	-0.5	-1.0
govt.debt	in % of GDP	98.9	98.5	96.5	93.2	89.0	84.5
gross govt. Investment	in % of GDP	1.9	1.9	1.9	1.9	1.9	1.9
net govt. Investment	in % of GDP	-0.3	-0.4	-0.3	-0.2	-0.2	-0.1
		golden rule scenario (deviations from baseline)					
Net-Investment-Stance	in % of GDP		0.6	1.2	1.6	1.6	1.6
additional "structural" leeway	in % of GDP		0.0	0.2	0.3	0.7	1.1
total fiscal stance	in % of GDP		0.6	1.4	1.9	2.3	2.7
real GDP	in %		1.1	2.5	3.5	4.1	4.7
"potential"GDP	in %		0.2	0.8	1.7	2.7	3.7
GDP growth rate	in %-points		1.2	1.4	1.0	0.6	0.6
government budget deficit	in %-points		0.1	0.3	0.5	0.7	0.8
debt/GDP-ratio	in %-points		-1.3	-2.6	-3.2	-3.0	-2.7
cumulative inflation	in %-points		0.3	0.8	1.1	1.2	1.4
France							
		2015	2016	2017	2018	2019	2020
		baseline scenario					
real GDP growth	in %		1.5	1.5	1.8	1.8	1.8
real_GDP_Index	in %	100.0	101.5	103.0	104.8	106.7	108.5
inflation rate	in %		0.9	1.3	1.7	1.7	1.7
government deficit	in % of GDP	3.8	3.3	2.7	1.9	1.1	0.5
govt.debt	in % of GDP	96.3	97.0	96.9	95.5	93.5	91.0
gross govt. Investment	in % of GDP	3.6	3.4	3.3	3.2	3.2	3.2
net govt. Investment	in % of GDP	0.1	0.1	0.0	0.0	0.0	0.0
		golden rule scenario (deviations from baseline)					
Net-Investment-Stance	in % of GDP		0.5	0.9	1.4	1.4	1.4
additional "structural" leeway	in % of GDP		0.1	0.2	0.4	0.7	1.1
total fiscal stance	in % of GDP		0.5	1.1	1.9	2.2	2.6
real GDP	in %		0.8	1.6	2.6	3.0	3.5
"potential"GDP	in %		0.1	0.5	1.1	1.9	2.7
GDP growth rate	in %-points		0.8	0.9	1.0	0.4	0.4
government budget deficit	in %-points		0.1	0.2	0.4	0.6	0.8
debt/GDP-ratio	in %-points		-0.8	-1.6	-2.3	-2.1	-1.7
cumulative inflation	in %-points		0.2	0.5	0.8	0.9	1.0

**Table A2 (continued): Macroeconomic indicators for the ex-ante simulations: Baseline scenario and golden rule scenario 2015 to 2020**

Italy							
		2015	2016	2017	2018	2019	2020
		baseline scenario					
real GDP growth	in %		1.4	1.5	1.4	1.3	1.3
real_GDP_Index	in %	100.0	101.4	102.9	104.4	105.7	107.1
inflation rate	in %		1.2	1.8	1.9	1.8	1.8
government deficit	in % of GDP	2.5	1.4	0.2	-0.5	-0.9	-1.3
govt.debt	in % of GDP	132.5	130.9	127.4	123.4	120.0	116.0
gross govt. Investment	in % of GDP	2.3	2.3	2.3	2.3	2.3	2.3
net govt. Investment	in % of GDP	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4
		golden rule scenario (deviations from baseline)					
Net-Investment-Stance	in % of GDP		0.6	1.2	1.8	1.8	1.8
additional "structural" leeway	in % of GDP		0.0	0.2	0.2	0.7	1.2
total fiscal stance	in % of GDP		0.6	1.5	2.0	2.5	2.9
real GDP	in %		1.0	2.4	3.3	3.9	4.6
"potential"GDP	in %		0.2	0.7	1.6	2.6	3.6
GDP growth rate	in %-points		1.0	1.3	0.9	0.6	0.6
government budget deficit	in %-points		0.1	0.2	0.3	0.5	0.7
debt/GDP-ratio	in %-points		-1.7	-3.5	-4.5	-4.8	-4.8
cumulative inflation	in %-points		0.3	0.7	1.0	1.2	1.3
Luxemburg							
		2015	2016	2017	2018	2019	2020
		baseline scenario					
real GDP growth	in %		3.6	3.3	3.0	2.8	2.8
real_GDP_Index	in %	100.0	103.6	107.0	110.2	113.3	116.5
inflation rate	in %		0.4	1.1	1.2	1.0	1.0
government deficit	in % of GDP	-0.1	-0.7	-0.7	-0.9	-0.8	-0.8
govt.debt	in % of GDP	23.9	24.2	24.2	24.0	23.8	23.6
gross govt. Investment	in % of GDP	3.7	3.9	4.0	4.0	4.0	4.1
net govt. Investment	in % of GDP	1.5	1.6	1.7	1.8	1.8	1.7
		golden rule scenario (deviations from baseline)					
Net-Investment-Stance	in % of GDP		0.0	0.0	0.0	0.0	0.0
additional "structural" leeway	in % of GDP		0.7	1.5	1.6	1.7	1.7
total fiscal stance	in % of GDP		0.7	1.5	1.6	1.7	1.7
real GDP	in %		0.3	0.7	0.7	0.7	0.8
"potential"GDP	in %		0.1	0.2	0.4	0.6	0.7
GDP growth rate	in %-points		0.3	0.4	0.0	0.0	0.0
government budget deficit	in %-points		0.6	1.2	1.3	1.3	1.4
debt/GDP-ratio	in %-points		0.5	1.6	2.8	4.0	5.2
cumulative inflation	in %-points		0.1	0.2	0.2	0.2	0.2

**Table A2 (continued): Macroeconomic indicators for the ex-ante simulations: Baseline scenario and golden rule scenario 2015 to 2020**

Netherlands							
		2015	2016	2017	2018	2019	2020
		baseline scenario					
real GDP growth	in %		1.8	1.6	1.6	1.6	1.6
real_GDP_Index	in %	100.0	101.8	103.4	105.1	106.8	108.5
inflation rate	in %		0.8	0.9	0.9	1.0	1.0
government deficit	in % of GDP	1.8	1.2	0.7	0.7	0.4	0.0
govt.debt	in % of GDP	68.8	67.8	67.0	66.1	65.0	63.5
gross govt. Investment	in % of GDP	3.5	3.4	3.3	3.3	3.3	3.3
net govt. Investment	in % of GDP	0.2	0.1	0.1	0.1	0.1	0.1
		golden rule scenario (deviations from baseline)					
Net-Investment-Stance	in % of GDP		0.5	0.9	1.3	1.3	1.3
additional "structural" leeway	in % of GDP		0.1	0.2	0.5	0.7	1.0
total fiscal stance	in % of GDP		0.6	1.2	1.8	2.0	2.3
real GDP	in %		0.6	1.2	1.8	2.0	2.2
"potential"GDP	in %		0.1	0.4	0.8	1.3	1.8
GDP growth rate	in %-points		0.6	0.6	0.6	0.2	0.2
government budget deficit	in %-points		0.2	0.5	0.8	0.9	1.1
debt/GDP-ratio	in %-points		-0.3	-0.3	0.0	0.7	1.6
cumulative inflation	in %-points		0.2	0.3	0.5	0.6	0.7
Austria							
		2015	2016	2017	2018	2019	2020
		baseline scenario					
real GDP growth	in %		1.4	1.5	1.7	1.9	1.7
real_GDP_Index	in %	100.0	101.4	102.9	104.7	106.7	108.5
inflation rate	in %		1.7	1.7	1.6	1.6	1.6
government deficit	in % of GDP	2.2	1.6	1.3	0.9	0.5	0.1
govt.debt	in % of GDP	86.8	85.7	84.1	82.2	79.7	77.0
gross govt. Investment	in % of GDP	2.9	2.8	2.8	2.8	2.7	2.7
net govt. Investment	in % of GDP	0.3	0.3	0.3	0.3	0.3	0.3
		golden rule scenario (deviations from baseline)					
Net-Investment-Stance	in % of GDP		0.4	0.8	1.2	1.2	1.2
additional "structural" leeway	in % of GDP		0.3	0.4	0.6	0.8	1.1
total fiscal stance	in % of GDP		0.7	1.2	1.8	2.0	2.3
real GDP	in %		0.8	1.4	2.0	2.3	2.5
"potential"GDP	in %		0.1	0.5	1.0	1.5	2.1
GDP growth rate	in %-points		0.8	0.6	0.7	0.2	0.2
government budget deficit	in %-points		0.3	0.5	0.8	0.9	1.1
debt/GDP-ratio	in %-points		-0.5	-0.6	-0.4	0.3	1.1
cumulative inflation	in %-points		0.2	0.4	0.6	0.7	0.7



**Table A2 (continued): Macroeconomic indicators for the ex-ante simulations: Baseline scenario and golden rule scenario 2015 to 2020**

Portugal							
		2015	2016	2017	2018	2019	2020
		baseline scenario					
real GDP growth	in %		2.0	2.4	2.4	2.4	2.0
real_GDP_Index	in %	100.0	102.0	104.4	107.0	109.5	111.7
inflation rate	in %		1.4	1.4	1.4	1.4	1.4
government deficit	in % of GDP	2.7	1.8	1.1	0.6	-0.2	-0.5
govt.debt	in % of GDP	124.2	121.5	116.6	112.1	107.6	103.5
gross govt. Investment	in % of GDP	2.3	2.2	2.2	2.3	2.2	2.2
net govt. Investment	in % of GDP	-1.2	-1.1	-1.0	-0.9	-0.9	-0.8
		golden rule scenario (deviations from baseline)					
Net-Investment-Stance	in % of GDP		0.9	1.6	2.3	2.3	2.2
additional "structural" leeway	in % of GDP		0.0	0.3	-0.2	0.2	0.7
total fiscal stance	in % of GDP		0.9	1.9	2.1	2.5	2.9
real GDP	in %		1.3	2.9	3.3	3.9	4.4
"potential"GDP	in %		0.2	0.9	1.8	2.8	3.7
GDP growth rate	in %-points		1.3	1.6	0.5	0.5	0.5
government budget deficit	in %-points		0.2	0.5	0.5	0.7	0.9
debt/GDP-ratio	in %-points		-1.8	-3.4	-3.4	-3.2	-2.8
cumulative inflation	in %-points		0.4	0.9	1.0	1.2	1.3
Finland							
		2015	2016	2017	2018	2019	2020
		baseline scenario					
real GDP growth	in %		1.4	1.5	1.3	1.2	1.2
real_GDP_Index	in %	100.0	101.4	102.9	104.3	105.5	106.8
inflation rate	in %		1.4	1.6	1.9	1.9	1.9
government deficit	in % of GDP	3.4	3.2	3.1	2.7	2.5	2.3
govt.debt	in % of GDP	62.5	64.4	66.0	67.0	67.8	68.0
gross govt. Investment	in % of GDP	4.3	4.3	4.2	4.2	4.1	4.1
net govt. Investment	in % of GDP	0.4	0.4	0.4	0.4	0.4	0.4
		golden rule scenario (deviations from baseline)					
Net-Investment-Stance	in % of GDP		0.4	0.7	1.1	1.0	1.1
additional "structural" leeway	in % of GDP		0.4	0.5	0.7	1.0	1.2
total fiscal stance	in % of GDP		0.7	1.3	1.8	2.0	2.3
real GDP	in %		0.8	1.5	2.1	2.4	2.6
"potential"GDP	in %		0.1	0.5	1.0	1.6	2.2
GDP growth rate	in %-points		0.9	0.6	0.7	0.3	0.3
government budget deficit	in %-points		0.3	0.5	0.7	0.9	1.0
debt/GDP-ratio	in %-points		-0.4	-0.3	-0.1	0.5	1.3
cumulative inflation	in %-points		0.3	0.4	0.6	0.7	0.8

**Table A2 (continued): Macroeconomic indicators for the ex-ante simulations: Baseline scenario and golden rule scenario 2015 to 2020**

Euro area (12 countries)							
		2015	2016	2017	2018	2019	2020
		baseline scenario					
real GDP growth	in %		1.7	1.7	1.7	1.7	1.7
real_GDP_Index	in %	100.0	101.7	103.4	105.2	107.0	108.9
inflation rate	in %		1.2	1.6	1.7	1.7	1.7
government deficit	in % of GDP	2.2	1.6	0.9	0.4	0.0	-0.4
govt.debt	in % of GDP	94.6	93.4	91.5	89.1	86.5	83.7
gross govt. Investment	in % of GDP	2.7	2.6	2.6	2.5	2.5	2.5
net govt. Investment	in % of GDP	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
		golden rule scenario (deviations from baseline)					
Net-Investment-Stance	in % of GDP		0.5	1.0	1.5	1.5	1.5
additional "structural" leeway	in % of GDP		0.1	0.2	0.4	0.7	1.1
total fiscal stance	in % of GDP		0.6	1.3	1.9	2.2	2.6
real GDP	in %		0.8	1.8	2.7	3.1	3.5
"potential"GDP	in %		0.1	0.6	1.2	2.0	2.8
GDP growth rate	in %-points		0.8	1.0	0.9	0.4	0.4
government budget deficit	in %-points		0.1	0.3	0.5	0.7	0.8
debt/GDP-ratio	in %-points		-0.8	-1.6	-2.0	-1.7	-1.3
cumulative inflation	in %-points		0.2	0.5	0.8	0.9	1.0

Source: European Commission (2016a); national stability programmes as of European Commission (2016b); author's calculations.

## **Impressum**

**Publisher:** Hans-Böckler-Stiftung, Hans-Böckler-Str. 39, 40476 Düsseldorf, Germany

**Phone:** +49-211-7778-331, [IMK@boeckler.de](mailto:IMK@boeckler.de), <http://www.imk-boeckler.de>

**IMK Working Paper is an online publication series available at:**

[http://www.boeckler.de/imk\\_5016.htm](http://www.boeckler.de/imk_5016.htm)

**ISSN:** 1861-2199

The views expressed in this paper do not necessarily reflect those of the IMK or the Hans-Böckler-Foundation.

All rights reserved. Reproduction for educational and non-commercial purposes is permitted provided that the source is acknowledged.