

# Three small essays on public investment: economic rationales, the EU fiscal framework and some statistical comparisons

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*Governments undertake public investments for a number of reasons. First, spending on public investment is a means to foster economic growth, in the short run by increasing aggregate demand and in the long run by (potentially) increasing growth potential. Second, public investments can be justified by the presence of market failures. And finally, they can be undertaken due to fairness objectives. Given the growth-enhancing impact of public investment expenditure, the EU has taken several initiatives to increase the low and, during the crisis, falling level of public investment in the EU. Most prominently, an investment clause was introduced into the Stability and Growth Pact (SGP), and the Investment Plan for Europe was launched. This can be considered an (albeit imperfect) substitute for the “golden rule” advocated by its proponents since the launch of the SGP. The ratio of government investment in Austria, at about 3% of GDP, is relatively far above that of Germany (around 2% of GDP), and has recently surpassed the euro area average. However, these figures are somewhat distorted by different sector classifications in the areas of transport, hospitals and municipal services.*

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Since the onset of the crisis, public investment has been repeatedly brought up as a remedy to foster growth. In the short run, investment raises aggregate demand through the fiscal multiplier and can thus push economic growth. In the long run, a higher public capital stock generally increases the productive capacity of the economy, thus lifting potential growth. Nevertheless, public investment fell considerably during the crisis, and the countries that were hit hardest by the crisis (e.g. Greece, Spain and Portugal) reduced investment expenditure the most. Cutting back investment expenditure to consolidate the public budget might have lower short-term (political) costs than raising taxes or cutting social expenditure, subsidies or government employment. Given the growth-enhancing impact of investment expenditure, policymakers

and academics alike have repeatedly called for special investment provisions in the EU fiscal framework. While some provisions have been introduced into the Stability and Growth Pact (SGP) recently, the often-advocated “golden rule” (that would exempt investment from deficit calculations) is not part of the SGP. This is at least partly due to difficulties with the definition and classification of public investment and the question which kind of public investment should benefit from the golden rule. Different legal and institutional settings might lead to the same type of investment being classified as private investment in one country while qualifying as public investment in another.

The rest of the paper is structured as follows: Section 1 provides a definition of public investment. In section 2, we discuss the economic rationales for public

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investment, focusing on its impact on short- and long-run growth. Section 3 highlights how the EU fiscal framework treats public investment and presents the latest EU initiative to promote investment (Investment Plan for Europe). Section 4 looks at the structure of public investment in Austria over time and in an international comparison, and section 5 concludes.

## 1 Definition of public investment

This paper focuses on investments in depreciable nonfinancial assets. Hence, in line with common practice, we disregard purchases of financial assets (e.g. bonds, stocks) and of non-depreciable assets (e.g. paintings) or non-produced assets (e.g. land). We follow mostly the national accounts definition of gross fixed capital formation, which is the net acquisition of fixed assets, where “fixed assets are produced assets used in production for more than one year” (Eurostat, 2013, p. 73f.). Furthermore, by public investment we typically refer to gross fixed capital formation undertaken by entities considered part of general government<sup>2</sup> in the national accounts. The definition of government entities in the European System of Accounts (ESA) focuses on government-controlled units primarily financed by taxes, thereby excluding public corporations primarily financed by market revenue (like road tolls or waste collection charges) and privately controlled entities mostly financed by taxes (e.g. church-run hospitals). In some cases, public-private partnerships are also not recorded on the government balance.

The scope of what constitutes a fixed asset and what is a government entity

can be subject to debate and has changed over time in the national accounts (see also box 1 in section 4). For example, the size of the government sector has increased with the introduction of ESA 2010. Furthermore, while expenditure on research and development has recently been included in the definition of gross fixed capital formation, investment in human capital (e.g. education) is generally recorded as consumption expenditure. Given that investment in intangible assets (such as on-the-job education and training, market development, and organizational and management efficiency) is becoming increasingly important in modern economies, the discussion on how to incorporate them in the national accounts has gained momentum. Thum-Thysen et al. (2017) state that in most EU-15 countries the share of intangible assets not included in the national accounts is higher than that included.

In addition to these narrowly defined forms of public investment, governments provide investment grants to (partly) government-owned firms, which are not classified in the government sector in national accounts. Moreover, governments can also spur private investment by providing fiscal incentives, such as subsidies, or tax incentives to private institutions.

## 2 Economic rationale for public investment

There are a number of reasons why governments undertake public investments. First, spending on public investment is a means to foster economic growth, in the short run by increasing aggregate demand and in the long run by (potentially) raising growth potential.

<sup>2</sup> General government “consists of institutional units which are non-market producers whose output is intended for individual and collective consumption, and are financed by compulsory payments made by units belonging to other sectors, and institutional units principally engaged in the redistribution of national income and wealth” (Eurostat, 2013, p. 44).

Second, public investments can help correct market failures, and finally, public investment can be undertaken due to fairness objectives. This section provides an overview of these arguments and briefly discusses some considerations regarding the optimal level of public investment expenditure.

### 2.1 Public investment and economic growth

Public investment has a positive impact on output in both the short and long run. In the short run, it raises aggregate demand through the fiscal multiplier. In episodes of low or even negative growth, a spending increase can push economic growth and thus contribute to macroeconomic stability. A large empirical literature has emerged to identify the size of the fiscal multiplier (for an overview, see IMF, 2014b). In general, fiscal multipliers are found to be larger during economic downturns (Auerbach and Gorodnichenko, 2012) and when monetary policy is at the zero lower bound (Christiano et al., 2011). Structural characteristics like trade openness (Ilzetzki et al., 2013), labor market rigidities (Gorodnichenko et al., 2012) and the magnitude of automatic stabilizers (Dolls et al., 2012) have an impact on the size of the fiscal multiplier, too. All these characteristics also apply to the fiscal multiplier of public funds spent on investment; it is typically found to be larger than for other types of spending and tends to have longer-lasting effects on output (IMF, 2015).

A supply-side effect of public investment arises because a higher public capital stock in principle increases the productive capacity of the economy. For example, many types of public infrastructure (e.g. transport or energy networks) are essential inputs in the private production process. Augmenting the productive public capital stock can therefore lead to higher efficiency in the private sector and contribute to long-run growth. Following the influential contribution by Aschauer (1989), a large empirical literature has emerged to estimate the output elasticity of public capital, which describes the percentage change in output for an increase in the public capital stock by 1%. Bom and Ligthart (2014) conducted a metaanalysis of the empirical literature and noted that earlier studies, like the one by Aschauer (1989), found rather large effects, while later studies arrive at substantially lower estimates.<sup>3</sup>

The large heterogeneity of results found in the literature, ranging from slightly negative to large and positive effects, can be explained by both methodological and economic factors. Methodological differences mostly stem from varying definitions of public investment or output (e.g. all public capital vs. infrastructure capital or private sector output vs. total GDP), from the different approaches employed<sup>4</sup> and from whether endogeneity and nonstationarity are addressed properly. The key economic factors that determine the long-run effect are related to the efficiency of government investment and to characteristics

<sup>3</sup> The study by Aschauer (1989) and the meta-analysis by Bom and Ligthart (2014) follow the so-called production function approach, which includes the stock of public capital as an additional input in the production function. Aschauer (1989) found that a 1% increase in the public capital stock increased private output by 0.39%. Using a meta-regression analysis, Bom and Ligthart (2014) find an average output elasticity of public capital of 0.12% in the long run for all public capital provided by the national government. Their estimates increase if they consider only core public capital and public capital provided by local entities.

<sup>4</sup> Besides the production function approach, several other approaches have been used to investigate the impact of public capital on (private) output: the cost-function approach (e.g. Cohen and Morrison Paul, 2004), VAR models (e.g. Kamps, 2005a) and cross-country growth regressions (e.g. Easterly and Rebelo, 1993). The IMF uses forecast errors to identify the macroeconomic effects of public investment (IMF, 2015).

of the existing capital stock. Not all forms of public investment contribute to the productive public capital stock in the same manner; distortions in project choice and implementation might arise due to political economy reasons (e.g. lobbying, election cycle), illegal corruption or deficient institutional arrangements.<sup>5</sup> By comparing the value of public capital (input) with measures of infrastructure coverage and quality (output), the IMF estimates that on average around 30% of the potential gains from public investment are lost due to inefficiencies in the public investment process (IMF, 2015).<sup>6</sup> Regarding the characteristics of the public capital stock already in place, in particular size and quality seem to matter. The growth effects of public investment are likely to be nonlinear: If public capital is already close to its saturation level, further investments are likely to yield little to no effects. In advanced countries, this might be the case for core infrastructure stocks.

Public investment seems to have both a short- and long-term impact on output, so in principle it yields a so-called double dividend. However, in many cases, a trade-off might emerge between the short- and long-term dividends (European Commission, 2016). If the objective of an investment project is to stimulate aggregate demand, it has to be launched quickly and should mainly rest on locally available inputs. Such projects might not generate large long-term effects. Large infrastructure projects that potentially yield large returns in the long run typically involve

long administrative procedures and for this reason might not be the go-to solution to stimulate growth in the short run.

## 2.2 Market failure and fairness aspects

Another reason for governments to undertake public investments is the desire to correct for market failures and achieve fairness objectives. In the presence of market failures, government intervention can lead to a more efficient allocation of resources in terms of social welfare, as private sector provision leads to inefficient outcomes or excess rents for private producers. One relevant reason for public investment is the supply of public goods, which, due to their characteristics (non-rivalrous, non-excludable), are likely to be under-supplied by the private sector. Typical examples are transport infrastructures<sup>7</sup>, public recreation areas, noise barriers, avalanche barriers or clean water. While transport infrastructure is an important input in the private production process, this is not necessarily the case for the latter examples. Clean water or public recreation areas increase social welfare, but they have no direct impact on the production process and for this reason are likely to have no or only a small effect on long-run output.<sup>8</sup>

Another market failure that calls for public intervention is the presence of externalities. For example, the provision of public transport systems also serves the purpose of reducing pollution. Public investments related to education or research can be justified by positive externalities stemming from human

<sup>5</sup> Dabla-Norris et al. (2012) construct a Public Investment Management Index and highlight the factors that determine public investment efficiency in greater detail.

<sup>6</sup> The sample consists of 134 countries; the estimates differ substantially between countries.

<sup>7</sup> Transport infrastructure (e.g. roads, railways) is not a pure public good, as excludability is in principle possible.

<sup>8</sup> In the short run, the typical fiscal multiplier applies. The effect on long-run output can go in both directions. On the one hand, these expenditures have to be financed by either expenditure cuts in other areas, distortive taxes or public debt, leading to lower output. On the other hand, a healthier or more content society might be more productive.

capital and knowledge spillovers (e.g. Moretti, 2004). Another category of market failure that justifies public provision or regulation is the presence of a natural monopoly due to economies of scales. This is mostly relevant for public utilities like water, electricity or public transit, where government intervention is required to prevent privately-controlled monopolies. Finally, due to imperfect capital markets (credit constraints), private firms might be unable to finance large and risky projects with a long time horizon, so the public sector is required to carry out such projects. In principle, government intervention through either direct provision or some form of regulation leads to more efficient resource allocation in all these cases. However, public intervention is typically accompanied by other forms of inefficiencies (government failure), which can lead to distortions.

From a welfare perspective, government intervention can also be justified by the government's fairness goals. That is, even in the absence of market failure or a growth objective, governments might undertake public investments to reach their redistributive goals. From a pure efficiency perspective, public investments motivated by redistributive objectives might often be unattractive as they imply a classical efficiency-equity tradeoff.

When discussing the redistributive impact of public investment, it makes sense to differentiate between redistribution across individuals and across regions. Redistribution across individuals is largely achieved through the tax and transfer system, but to some extent also through public investment, e.g. in public hospitals, schools or other forms of public infrastructure: These services, which are mostly tax-financed, can be used by the whole population at no or low cost. As the tax burden differs across individuals, this implies a redistribution of

resources. Further, if these services were provided privately, some people would probably be excluded by a pricing mechanism, leading to lower welfare for those affected.

In order to achieve redistribution across regions, most countries have some form of fiscal equalization mechanism in place that leads to financial transfers to disadvantaged regions, where the funds are spent (among other things) on local infrastructure. The share of public investment undertaken by local government is large in many countries. In addition, central governments also invest in public infrastructure in remote areas and in this way contribute to a redistribution across regions.

### **2.3 Optimal public investment spending**

Given these arguments, how much should governments spend on public investment and to which types of projects should they direct these funds? Some papers (e.g. Aschauer, 2000; Kamps, 2005b) try to arrive at the optimal capital stock from a growth perspective. These studies make the plausible assumption that the growth effects induced by an increasing capital stock are nonlinear – the relationship between public capital and growth is positive up to a certain level but turns negative above the growth-maximizing point. Intuitively, when the public capital stock is low, inefficiencies might arise e.g. due to congested roads or poor Internet connections; on the other hand, when the public capital stock is already high, the economic cost of the tax burden required to finance and maintain public capital might be larger than the additional benefit. Aschauer (2000) finds that during the 1980s and 1990s, the level of public capital in most areas of the U.S.A. was below the levels that would have maximized the

rate of economic growth. For the EU, Kamps (2005b) finds that in the early 2000s, the level of public investment was roughly in line with the growth-maximizing level in most pre-enlargement EU Member States.

As these papers focus on the optimal aggregate level of public capital, they offer little guidance on the type of projects public investment expenditures should be directed to. There is some empirical evidence that investment in core infrastructure (e.g. roads, telecommunications) has a stronger impact on output compared to other investments in physical output (Bom and Ligthart, 2014). However, in advanced countries, the public capital stock for core infrastructure might already be close to its saturation level, suggesting lower growth effects. A number of other papers (e.g. Gemmell et al., 2016) investigate the relationship between government expenditure and growth by focusing on the functional breakdown of expenditure rather than distinguishing between capital and current spending. For a sample of OECD countries, Gemmell et al. (2016) find that reallocating spending towards infrastructure and education is positive for long-run output levels, whereas spending reallocated towards social transfers may be associated with negative effects on output in the long run.

The papers mentioned so far focus solely on the impact of public investment or public expenditure on long-run output, while other policy objectives, such as the correction of market failures or redistributive goals, are left aside. From a welfare point of view, the conclusions reached by these types of analysis might be misleading. For example, building better roads or a

larger airport might be optimal from a growth perspective, whereas investing in other, more environmentally friendly means of transport might be preferable from a welfare perspective. Economic growth clearly is an important source of social welfare, as it increases (future) income opportunities and has positive employment effects, but considered in isolation, it might lead to misleading policy recommendations. From the perspective of social welfare, public investment expenditure should be increased as long as the social marginal benefit is larger than the social marginal cost. This is, of course, only a theoretical relationship that is hard to assess in practice. Nevertheless, it is a useful thought experiment to structure the arguments in favor of or against a specific public investment project; in addition, it is typically the theoretical basis for most forms of cost-benefit analysis.

To conclude, there is no straightforward optimality condition for the level of public investment, as the optimal level depends on the weighting of policy objectives (short- and long-run growth, allocation efficiency, redistribution). A number of tradeoffs are likely to emerge between the different objectives. In the end, it is a political decision: Which goals does the government want to reach through its public investment policy? Economist can try to assess which projects are best suited to reach these goals. A helpful tool in this context is cost-benefit analysis; however, a number of measurement problems makes it difficult to come to clear-cut conclusions. Other important parameters for policy advice are good empirical estimates on the growth effects of public investment (both short- and long-run effects).

### 3 Public investment and the EU fiscal framework

Since the very beginning, the EU fiscal framework has been criticized for possibly curbing public investment in EU Member States (Balassone and Franco, 2000). Given rigid budget constraints, cutting back on investment expenditure might be associated with lower short-term (political) costs than raising taxes or cutting social expenditure, subsidies or government employment. Blanchard and Giavazzi (2004) found that public investment in the twelve original euro area countries (EA-12) countries fell by 0.8 percentage points during the run-up to Economic and Monetary Union (1993–1997). In turn, lower public sector contribution to capital accumulation might put a strain on a country's short- and long-term growth prospects (see section 2).

Therefore, both policymakers and academics (Creel, 2003; Blanchard and Giavazzi, 2004; Barbiero and Darvas, 2014; Truger, 2015) have repeatedly advocated the incorporation of a “golden rule” in the EU fiscal framework. This golden rule would exclude some types of investment spending from the computation of the fiscal variables relevant in the EU fiscal framework. Balassone and Franco (2000) compare three different golden rules: Under the first one (proposed by Modigliani et al., 1998), net investment is excluded from the computation of deficit targets. Under the German golden rule, deficits are allowed up to gross investment expenditure, and under the UK golden rule, deficit targets may not exceed net investment expenditure over the cycle. Creel

(2003) and Blanchard and Giavazzi (2004) suggest the introduction of a golden rule where, coupled with the creation of an investment agency, net public investment is excluded from the computation of the medium-term deficit target of the SGP. Later proponents of a golden rule modify the approach by suggesting a deduction of net public investment minus military expenditures plus investment grants for the private sector from the relevant fiscal variables (Truger, 2015) or an increase in the permitted structural deficit by the amount of net public investment whenever the negative output gap exceeds a certain threshold (Barbiero and Darvas, 2014). Aiginger (2014) proposes a “silver rule” where intangible investments (e.g. for education – which, however, does not qualify as an investment in ESA) are temporarily deductible, if they are qualitatively connected to structural reforms and supervised by an independent authority.<sup>9</sup>

In addition to promoting investment, the golden rule is appealing as it increases intergenerational equity. A higher public capital stock creates benefits for current and future generations in the form of higher productivity and higher per capita income. Hence, shifting part of the financing burden to future generations via debt service seems justified, as these generations profit from the deferred benefits (Truger, 2015). Otherwise, overburdening the current generation could lead to an underprovision of public investment, which might be particularly detrimental for countries with low capital stocks. In corporate accounting, too, the cost of an invest-

<sup>9</sup> *The Committee on Employment and Social Affairs referred repeatedly to a silver rule in the context of the European Pillar of Social Rights. In its 2016 draft report on a European Pillar of Social Rights it called “for a ‘silver rule’ on social investment to be applied when implementing the Stability and Growth Pact, namely to consider certain public social investments having a clear positive impact on economic growth (e.g. childcare or education and training) as being eligible for favourable treatment when assessing government deficits and compliance with the 1/20 debt rule.” (European Parliament, 2016, p. 9/14). However, this call is not included in the final report.*

ment is distributed over several years. This principle could be replicated by an appropriate golden rule.

Despite its merits, the golden rule has not been included in the EU fiscal framework. Arguments against the application of a golden rule that focuses on gross investment comprise the possible high and sustained deficits and public debt levels. High debt levels increase interest expenditure, which restricts other – possibly more productive – uses of public funds. Moreover, a golden rule entails the preferential treatment of physical capital over investment in other forms of capital (e.g. education), which may have economically unwarranted consequences (Balassone and Franco, 2000; Barbiero and Darvas, 2014). Even though some of these issues have been tackled by the adjusted golden or silver rules suggested, important shortcomings remain. First, the issue of data definition and classification remains: Which expenditure categories should be granted special budgetary treatment and to what extent – overall expenditure, or just additional expenditure? Second, already strong incentives for creative accounting (recording all expenditure as eligible investment expenditure) would be strengthened.

Still, investment expenditure is not completely disregarded in the European fiscal framework. The corrective arm, based on the Maastricht criteria, has always included a provision on investment expenditure. Article 126(3)<sup>10</sup> of the Treaty on the Functioning of the European Union (TFEU) states that the report about the existence of an excessive deficit “shall take into account whether the government deficit exceeds government investment expenditure.” However, this provision has never really

played a role in the decision about the existence of an excessive deficit.

In 2013, the preventive arm, which calls for sound fiscal positions (Medium Term Objective – MTO and the expenditure benchmark), was also equipped with a temporary investment provision. In a letter to the EU finance ministers, then Vice-President of the European Commission, Olli Rehn, explained how the European Commission would incorporate an investment clause into the preventive arm of the Stability and Growth Pact (Rehn, 2013). This investment clause allowed for a temporary deviation from the adjustment path and the MTO, given that (i) the Member State and the euro area or the EU as a whole are in a recession, (ii) budget deficits stay below the 3% thresholds and the debt rule is respected, and (iii) the deviation is linked to the national co-funding of EU projects under the Structural and Cohesion policy, Trans-European Networks and the Connecting Europe Facility. In 2013 and 2014, Bulgaria, Romania and Slovakia benefited from these provisions, while Italy was not allowed to use the clause. With its Communication of January 2015, the European Commission clarified the margin of interpretation it had with regard to the treatment of public investments within the existing framework of the Stability and Growth Pact. Compared with the previous guidance, the investment clause now only focuses on the economic condition of an individual Member State, irrespective of the conditions in the euro area or the EU as a whole. Moreover, the scope of eligible projects has been extended to include projects co-financed by the European Fund for Strategic Investments – EFSI (see box 2). However, the

<sup>10</sup> Formerly Article 104(3) of the Treaty establishing the European Community (TEC).



investment clause can only be invoked if investment levels are effectively increased as a result. Up until September 2017, only Finland and Italy benefited from the new investment clause. Given its numerous restrictions, it is unlikely that the clause will encourage public investment significantly. However, it aims to proactively counteract the

well-established (political) practice of cutting public investment in times of economic and financial distress.

In addition to these explicit provisions on investment expenditure in the preventive arm, another, more indirect, provision is specified in the expenditure benchmark. The expenditure benchmark generally allows annual

Box 1

### Investment Plan for Europe and European Fund for Strategic Investments<sup>1</sup>

*The Investment Plan for Europe (Juncker plan), announced in November 2014, intends to encourage investment and thereby stimulate economic growth in Europe. In addition to providing services for investment projects in the form of e.g. advisory hubs, it aims at removing regulatory barriers to investment and at mobilizing private and public financial resources. The centerpiece of this initiative is the European Fund for Strategic Investments (EFSI). The EFSI comprises a EUR 16 billion guarantee from the EU budget and a EUR 5 billion allocation of capital from the European Investment Bank (EIB). These EUR 21 billion are intended to trigger investments of EUR 351 billion between 2015 and 2018 in Europe. The EFSI allows the EIB Group to finance investment projects that would otherwise not receive EIB funding due to their risk profile. The investment projects focus on infrastructure, education and R&D, renewable energy and resource efficiency as well as support to SMEs. In principle, the EFSI considers projects on their individual merits without a sector or country quota. Given the EFSI's proven success, it was reinforced and extended to 2020 in September 2017 (EFSI 2.0). For the period until 2020, the EFSI has been equipped with funds of EUR 33.5 billion (+EUR 10 billion from the EU budget, +EUR 2.5 billion from the EIB). Hence, the overall expectations of investment to be unlocked have been revised to at least half a trillion euro by 2020. Furthermore, equity injections to the EFSI by contributing Member States are not considered in the EU fiscal framework, according to an explicit statement by the European Commission.<sup>2</sup>*

*For the period until end-November 2017, the European Commission (2017b) reports that total investment related to EFSI approvals came to EUR 252 billion or 80% of the amount targeted until 2018. EFSI-triggered investment (in % of GDP) was highest in Estonia, Bulgaria and Greece. Austria reached only rank 22, just slightly better than Germany. As of November 2017, total EFSI financing in Austria stood at EUR 930 million set to unlock EUR 2.8 billion in additional investment. So far, financing agreements have been signed for six projects, three of them in the energy sector (including Energiepark Bruck). The largest project is in the transport sector, namely the renewal of regional passenger trains amounting to EUR 500 million, set to trigger total investment in the amount of EUR 1,700 million. Three more projects have been approved but no agreements have been signed yet. Two of them are again classified as projects in the energy sector. Three more projects have received pre-approval, among them two for the construction and refurbishment of hospitals and Viennese schools, both planned as public-private partnerships. An evaluation of whether the EFSI goal of enabling risky investment to support economic growth has been achieved is still outstanding given that the Austrian projects are quite recent. In addition to assessing target achievement, the evaluation should also quantify the additional investment triggered ex post as well as possible windfall effects.*

<sup>1</sup> The information presented in this box is based on information provided by the European Commission (2017b) and EIB (2017)

<sup>2</sup> "National contributions to the EFSI will not be taken into account by the Commission when defining the fiscal adjustment under either the preventive or the corrective arm of the Pact." (European Commission, 2015, p. 8).

expenditure to grow in line with annual potential GDP growth. To calculate annual expenditure growth, nationally financed public investment is averaged over four years (years t-3 to t). This serves to take into account the variability of public investment, and in particular to refrain from discouraging large investment projects, which might have a huge impact on the budget in a given year. With this provision, the European fiscal framework aims to ensure that it does not curb public investment. Provisions to explicitly encourage public investment are not included, though.

#### 4 Public investment in Austria

##### 4.1 Government investment in Austria is dominated by transport and research

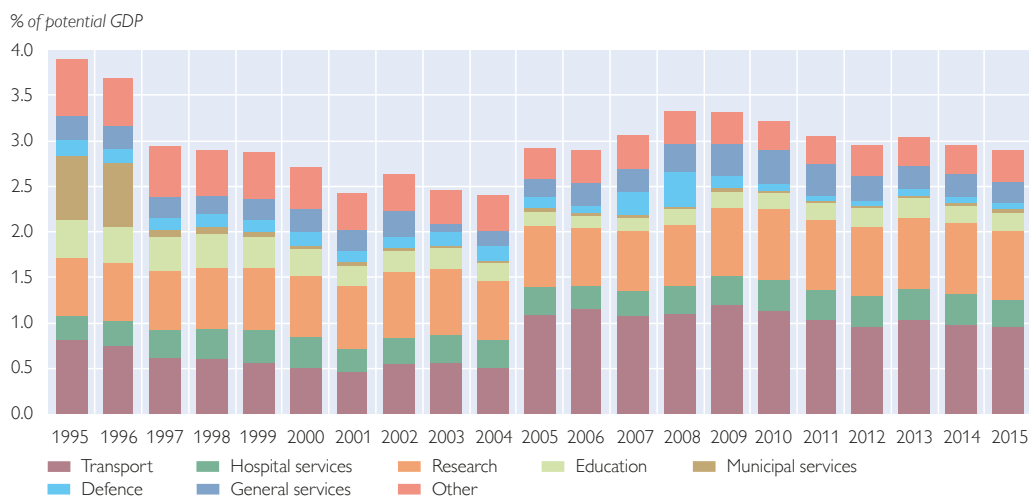
Chart 1 shows government investment in Austria for the period 1995–2015.<sup>11</sup> It highlights the strong impact of sector

classification issues, which are the main drivers of the two breaks clearly visible in the series: The most important reason for the decline in 1997 was the reclassification of municipal corporations (in the areas of waste and waste water management, water supply and housing) as entities outside the government sector. In 2005, parts of the Austrian Federal Railways, ÖBB, were classified as government entities after a reorganization. Since the most recent break in 2005, government investment has been typically around 3% of potential GDP.<sup>12</sup>

The highest investment ratios were reached in 2008 (import of Eurofighter jets) and in 2009 (peak in transport-related investment). When adjusting for the impact of military investments, the ratio of government investment to potential GDP in 2015 was approximately at pre-crisis (i.e. pre-2009) levels (chart 2). High non-military investment in 2009

Chart 1

#### Development in government investment in Austria



Source: Eurostat, European Commission.

<sup>11</sup> This chart is based on Eurostat data on “General government expenditure by function (COFOG)”, where government expenditure is decomposed along both economic (e.g. compensation of employees, subsidies) and functional (e.g. education, health) categories. Due to publication lags for this decomposition, this paper’s charts are based on data from the autumn 2016 notification.

<sup>12</sup> To avoid business cycle-driven spikes in the investment ratio, we divided investment by potential GDP instead of actual GDP.

and 2010 also indicates that government investment contributed significantly to the fiscal stimulus<sup>13</sup> in Austria.

The main areas of government investment are transport, research and hospital services. Transport-related investment typically makes up around 1% of (potential) GDP and consists primarily of investments undertaken by ÖBB and Wiener Linien (Vienna's public transport operator) as well as investments made by provinces and municipalities into their roads. Investment into R&D<sup>14</sup> makes up around ¾% of GDP and mostly consists of self-produced investments, i.e. the national statistical institute imputes a share of consumption expenditure by universities as investment (compensation of employees, intermediate consumption etc.).<sup>15</sup> In contrast to transport and R&D, investments in "hospital services" are made primarily by provinces and municipalities, as they run most public hospitals.

Investments in the areas of education<sup>16</sup> and public order and safety are seemingly low, because most buildings used by the federal government are rented from Bundesimmobiliengesellschaft (BIG), a publicly owned real estate company. Therefore, investments in a federal school building are typically recorded under "general services" and not under "secondary education"; the same is true for most police stations, courts of law and prisons. This somewhat distorts the Classification of the Functions of Government (COFOG) data published

by Eurostat and leads to oddities like that most public investment in public order and safety is made in the subcategory "fire protection services."

Public investment expenditure in the areas of research and defence is made mostly to correct for market failures, as these services would likely be underprovided by private entities. This is also true for investments in railroad networks, which make up a large part of transport-related investments. Meanwhile, investments in hospitals and education have a large distributional component. While these services could also be provided by nongovernment entities – who would charge (much higher) fees, though – such investments are mostly financed by taxes and social contributions in Austria.

More than half of government investment is currently undertaken by the federal government (e.g. Ederer et al., 2016). However, only a small share of that (typically below 0.2% of GDP) is recorded in the federal budget, as the bulk of federal investment expenditure is made by the autonomous universities and the public corporations ÖBB and BIG.

#### **4.2 Public investment outside the government balance sheet is also significant**

Even though many investment-intensive public corporations have been classified as government entities during the switch to ESA 2010 (see box 2), the volume of

<sup>13</sup> In light of the import of Eurofighter jets, adjusting for military investments makes the public investment figures more meaningful in terms of their economic impact on the private sector in Austria.

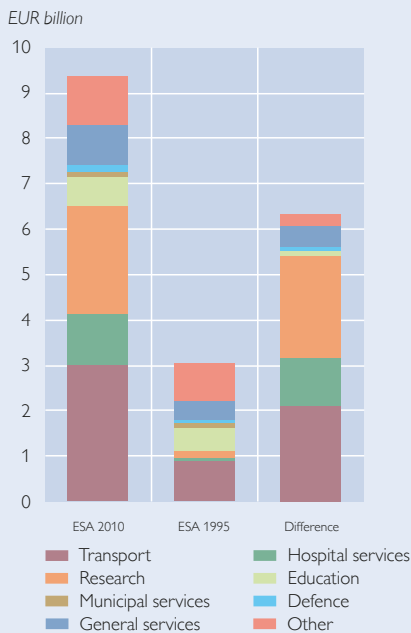
<sup>14</sup> "Research" is the sum of COFOG groups 01.04, 01.05, 02.04, 03.05, 04.08, 05.05, 06.05, 07.05, 08.05, 09.07 and 10.08. "Municipal services" is the sum of COFOG divisions 05 and 06 (excluding 05.05 and 06.05).

<sup>15</sup> Hence, part of the expenditure made by universities is recorded twice in the national accounts – under current expenditure (e.g. compensation of employees) and investment. To ensure that there is no impact on the budget balance, this investment is also recorded as government revenue in the subcategory "output for own final use."

<sup>16</sup> As explained in section 1, education expenditure as such is not considered part of (public) investment, and therefore the capital stock in the area of education mainly encompasses school buildings. Austria's public consumption expenditure in the area of education was around 4½% of potential GDP in 2015.

## Changeover to ESA 2010 and government investment

### Upward revision in Austrian government investment in 2012 due to ESA 2010



Source: Eurostat.

*military weapon systems as investment had a limited impact on Austrian government investment, the inclusion of R&D in investment had a sizeable impact.*

From 2005 to 2013, public investment in Austria was typically at just above 1% of GDP according to ESA 1995 numbers, while it was at around 3% of GDP according to current releases in those years. The following chart compares the last available release of COFOG data in ESA 1995 (2012) with the most recent COFOG data for that year. It shows that most of the difference comes from the areas research, transport and hospital services.

The increase in the latter two categories was due to a wider scope of the government sector in ESA 2010 owing to a broader definition of costs and a narrower definition of market revenue (see Stübler et al., 2015). This led to a reclassification of ÖBB Infrastruktur and Personenverkehr (the Federal Railways' infrastructure and passenger transport unit), of Wiener Linien (Vienna's public transport operator), of public hospitals owned by provinces and municipalities as well as of property management companies into the government sector. Furthermore, ESA 2010 broadened the scope of what kind of expenditure actually constitutes investment. While the definition of

public investment (in a broad sense) conducted by public corporations outside general government is still substantial. However, public-private partnerships off the government balance sheet play only a minor role in Austria: According to Eurostat data, their combined adjusted capital value was below 0.1% of GDP in 2015.

Many entities conducting public investment in a broad sense receive investment grants. In 2015, overall investment grants paid by government to nongovernment units were at around 0.6% of GDP. This amount is not solely attributable to public investment in a broad sense (for example, there are also significant investment grants in the area of agriculture),

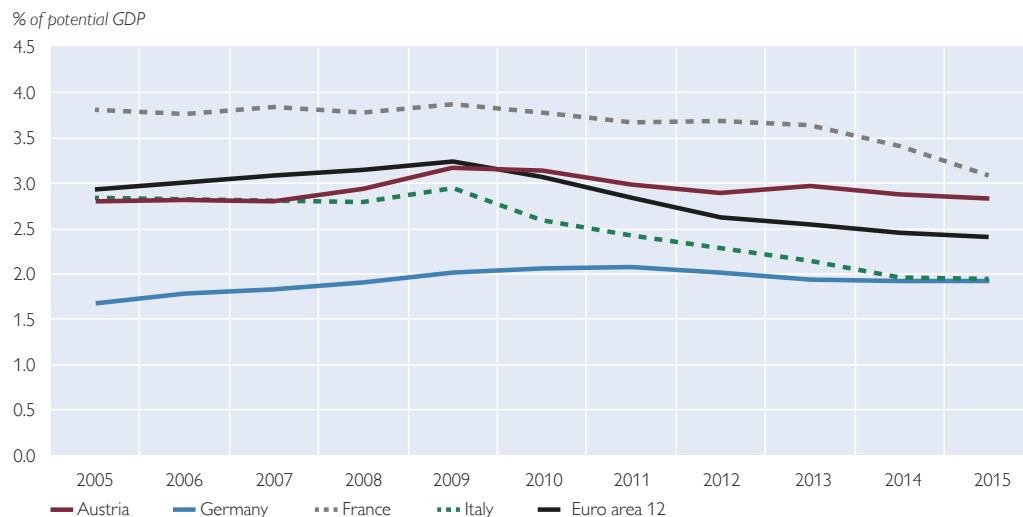
but includes substantial transfers to corporations conducting municipal services, especially in the area of waste water management. In addition, these investment grants also encompass transfers to private (mostly church-run) nonprofit schools and hospitals, which also provide public services.

### 4.3 Austria's government investment is above the euro area average

Since 1995, the ratio of government investment to GDP in Austria has consistently been higher than in Germany, and in recent years, it has surpassed the euro area average (chart 2). While government investment has grown roughly in line with potential GDP in Germany

Chart 2

### Government investment (without defence) since 2005

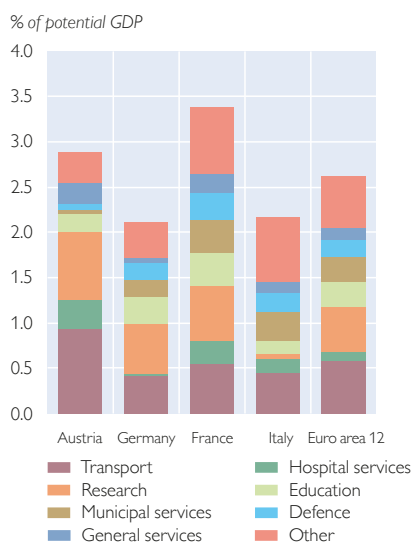


Source: Eurostat, European Commission.

Note: Euro area 12 stands for the 12 initial euro area members.

Chart 3

### Structure of government investment in 2015



Source: Eurostat, European Commission.

Note: Euro area 12 stands for the 12 initial euro area members.

and Austria since 2007, it has increased significantly less in the rest of the euro area (including France and Italy).

However, as chart 3 indicates, sector classification issues seriously hamper the comparison of both the level and structure of government investment. For example, the setup of BIG depresses the level of education investments<sup>17</sup> and inflates investment in general services. The level of health investments is distorted by the fact that hospitals are (mostly) classified inside government in Austria, but outside the government sector in Germany and a few other euro area countries. Furthermore, the German Deutsche Bahn Netze is not part of government while ÖBB Infrastruktur is, which contributes to transport investment being much higher in Austria than in Germany (e.g. Heimberger, 2017). At the same time, government investment related to municipal services is higher in Germany, France and Italy than it is in Austria (where these services are mostly conducted via municipal non-government units). The persistent differences in government investment between

<sup>17</sup> The fact that federal schools and universities, too, mostly rent their buildings from BIG is the reason why construction investment in the NACE category “education (P)” is far below the EU average.

Austria and Germany also translate into the estimates of the public capital stock, which (according to Eurostat numbers) stood at 59% of potential GDP in Austria and only 44% in Germany in 2015.

## 5 Conclusions

There seems to be general agreement that (public) investment has a positive impact on output in both the short and long run, albeit at different degrees depending on the capital stock of the economy and its cyclical position. A relevant reason for public (as opposed to private) investment is the supply of public goods, which, due to their characteristics (non-rivalrous, non-excludable), are likely to be undersupplied by the private sector. Despite these merits, government investment as a ratio to GDP in the euro area fell considerably during the crisis, declining by about 1 percentage point from 2009 to 2015, which has also been attributed to the restrictive nature of the European fiscal framework.

Given the growth-enhancing impact of investment expenditure, policymakers and academics alike have repeatedly called for special public investment provisions in the EU fiscal framework.

Even though the often-advocated golden rule is not part of the Stability and Growth Pact (SGP), other provisions have made their way into the SGP. Most prominently, the “investment clause” allows for deviations from the MTO that correspond to the size of additional investments during economically difficult times. However, the clause is quite restrictive in that only a few categories of investment qualify. This is at least partly due to difficulties with the definition and classification of public investment. Different legal and institutional settings might lead to the same type of investment being classified as private investment in one country while qualifying as public investment in another.

Adjusted for military investments, Austrian government investment peaked in 2009 and 2010 at more than 3% of GDP, thereby providing a stimulus during the Great Recession. Since then, it has roughly returned to pre-2009 levels of roughly 3% of GDP and has surpassed the euro area average. It has always been higher than in Germany (typically around 2% of GDP), but these figures have to be handled with caution due to different sector classifications in the areas of transport, hospitals and municipal services.

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