

## Public investment to support long-term economic growth in the EU

### SUMMARY

Public investment in the EU has decreased since the beginning of the crisis, especially in countries which needed to undergo fiscal consolidation. The authorities at different levels often face challenges in choosing optimal investments and expenditure in times of limited means. The economic literature, although sometimes inconclusive, suggests pre-conditions that make public investment beneficial to growth, such as high quality of public expenditure. Large government size appears to be negatively correlated to growth but certain public investments (for instance in infrastructure or innovation) and productive expenditure (such as on education and health) often seem to have long-term positive impacts on the economy.

In the current context, increased investment may boost demand and stimulate the economy in the low-interest-rate environment. A focus on growth-inducing investments is communicated in the EU's priorities and strategies, and is gaining more prominence in the European Semester process. The areas of investment most frequently mentioned, such as innovation and infrastructure, are in line with what the theory suggests as being growth-conducive. However, it is not evident whether and how the EU identifies those with the highest potential for long-term economic growth.



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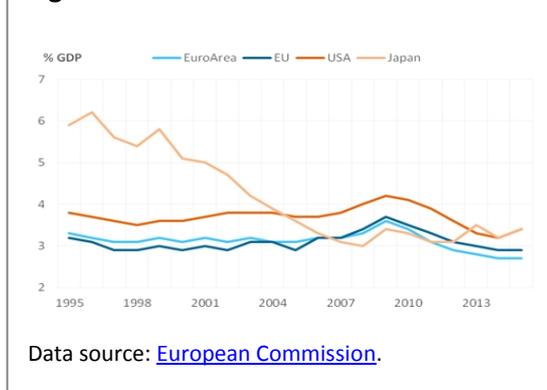
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## The issue

Since the economic and financial crisis, public investment levels have decreased in many EU Member States, especially those that needed to undergo fiscal adjustments due to market pressures. It is argued that these low levels of public investment, if they persist for a prolonged period, may lead to a deterioration of public capital and negatively affect longer-term output. The fall in public investment and the low interest rate environment have thus resulted in some economists advocating the deployment of public investment spending as a way to boost demand and the potential output of the EU economy. At the same time the fiscal positions of many EU countries remain under pressure, and the provisions of the Stability and Growth Pact demand further fiscal consolidation.

These circumstances, which make decisions on expenditure and public investment challenging for public authorities, underline the need to examine the potential effects of public investment on economic growth, so that informed choices on what might fuel the economy can be made.

**Figure 1 – Public investment**



## The size of government and economic growth

Economic literature has often suggested that the size of the government sector may have a positive impact on potential economic growth, employment and private investment. The majority of studies conclude that, up to a certain point, expansion of the public sector may be [conducive](#) to economic growth. This is essentially because the government ensures the institutional environment for economic transactions through, for example, the rule of law, enforcing property rights and the provision of necessary public services. Beyond a certain threshold, government inefficiencies and the distortionary impact of taxation on the economic decisions of firms and households have negative impacts on growth. Overall, based on the examination of existing research, the European Commission concluded that the macroeconomic link between the size of government and long-run growth is [not evident](#). Some argue that the growth-promoting effects of public investment [depend](#) more on the institutional and economic environment of the country and efficiency of public administration rather than its size. There are, however, others who claim that public investment increases growth by a [similar value](#) in efficient and inefficient countries.

## Growth-friendly government expenditure

As underlined by the International Monetary Fund (IMF), the economic literature makes a [distinction](#) between productive, or more growth-friendly, types of expenditure and less productive ones. A 2014 analysis by the [National Bank of Belgium](#) argues that there is 'a clear consensus ... that an increase in, or a shift towards, more productive expenditures raises output and/or growth for given hours worked and input of physical capital'. Shifting to more productive expenditure is considered to have a positive effect on [total factor productivity](#).

The items which are more often [mentioned](#) by the Commission and the literature as growth-conducive are **public infrastructure investments** (associated with increasing the capital stock in the economy), **education and training** (associated with boosting human

capital and skills), **research and development** (associated with technological development and innovation) and **health care** (which affects positively both the quantity and the productivity of labour). Having said that, although empirical research has identified a positive impact of some [expenditure components](#) on economic growth, economists do not yet [agree](#) on which categories these are. The Commission also underlines that there is a wide choice of public expenditure and ways in which it can be implemented, and as such it is 'difficult to provide a fully uncontroversial list of productive or growth-friendly expenditure items'.

### The role of public investment

Public investments are considered to be expenditure more directly linked to growth, since they are thought to increase the capital stock of the economy. The Commission considers that, theoretically, investments in infrastructure for transport and communications should be particularly beneficial as they create favourable conditions for undertaking private investment (the European Investment Bank (EIB) for example [spent](#) €19.1 billion on investment in infrastructure in 2015). However, the productivity and social returns of public investment may be strongly linked to the nature of the individual project, and the Commission envisages using cost-benefit analysis comparable to those deployed by the private sector to determine the productivity and efficiency of investments.

A recent study measuring the impact of public investment on [fiscal multipliers](#) (ratio in which the change in a nation's income level is influenced by government spending) found that public investment has quite a high fiscal multiplier value of 1.3 to 1.8. This means that €1 of general government expenditure in public investment increases gross domestic product (GDP) by an average of 30 to 80 cents. A paper examining 15 EU countries also found a positive impact of rising public investment on [long-term economic growth](#). There is also research demonstrating significant returns to [private-sector productivity](#) in the USA.

Furthermore, the [European Central Bank](#) demonstrated that public investment has a positive effect on economic growth. It estimates that a 1% increase in the public investment share of GDP would bring about a rise in growth of 1.6% over the long run. Furthermore, important [meta-studies](#) have also found a [positive relationship](#) between public investment and economic growth, demonstrated by positive demand effects in the short term, and contribution to public capital stocks over a longer period (however the results vary across countries and time). The IMF [suggests](#) that for advanced economies in a period of low growth, a public-investment spending shock (unanticipated investment) increases the level of output by about 1.5% in the same year and by 3% in the medium term. Furthermore, they argue that a 1% of GDP permanent boost in public investment increases output by about 2% in the same year. Output declines in the third year as monetary policy stabilises, then again increases to 2.5% over the long term because of the resulting higher stock of public capital. The OECD

#### Difficulties in measuring returns on public investment

Some researchers [claim](#) that public investment decisions, rather than being based on a systematic assessment of returns, are arbitrary and often taken in a non-transparent political process. However, estimating returns on public investments is extremely challenging. A paper finds quantitative measures of returns are very difficult or even impossible to calculate ex ante, while ex post estimates are often not robust, or are unavailable or context-specific. The authors argue that even though the economic literature suggests a positive impact of public investment on long-term growth, the usefulness of these models for return estimation is limited.

[estimates](#) that 0.5% of GDP investment stimulus can result in long-term output gains between 0.5% and 2% in the large advanced economies.

Nevertheless, some [reviews](#) of the existing literature find the empirical research to be inconclusive, even though the majority of studies seem to find a positive impact of public investment on growth (with heterogeneous results). This is mainly due to the difficulty of defining and measuring public investment, the complexity involved in isolating the effect of public investment on long-term growth and different methodologies used in research.

### **Crowding in and crowding out effects on private investment**

ECB [analysis](#) points out that public investment could have two effects on private investment. Financing the expansion of public investment may imply higher taxes or result in higher demand for funds from the government in the capital markets, therefore causing interest rates to go up. This would decrease the savings available for private investors and lower the expected rate of return of private capital, ultimately having a [crowding-out](#) effect on private investment. However public investment can also create favourable conditions for private investment, for instance, by providing or promoting required infrastructure such as roads, sewage systems, harbours and airports. The productivity of private investment may therefore be enhanced by the existence of infrastructure facilities and better business conditions. This would lead to a crowding-in effect on private investment. Taking this into account, the ECB found that the period between 1960 and 2005 had a contractionary effect on output in four EU Member States (mostly crowding-out), while for eight Member States crowding-in and positive effects prevailed. Private investment has been determined to have an expansionary effect on GDP in all the EU countries examined. A more recent paper [argues](#) that investments in physical and human capital are particularly important driving forces of economic growth in the medium and long run. All in all, much of the economic [research and literature](#) supports the growth-conducive role of public investment.

### **Overview of research on growth-conducive public investments**

Public investment projects need to be examined on a case by case basis to determine their return and effect on growth. There are however certain categories of public investment over which there seems to be less controversy with regard to their positive impact. In this context, the World Bank argues that the most [supported hypothesis](#) is that public spending in two areas – **education and infrastructure** – is positively correlated with [long-term](#) economic growth. Particularly for [high-income countries](#), spending on **education, health** and/or **transport and communication** shows evidence of positive growth. The same holds true for investment in [research and innovation](#). [Researching](#) cross-country data for 100 countries also found that **investments in public transport, communications and education** have a positive impact on economic growth. Another examination of the literature [confirmed](#) the above findings, and underlined the importance of investment in **health** for the productivity of labour and economic growth. The magnitude of the economic impact seems to be [higher](#) for core infrastructure (e.g. transport and power-generating facilities, communication systems), for regional investment and in the long run. Returns on public investment types are not directly comparable, however some reviews give estimates of the return of investment in core infrastructure in the range 17% to 35%, [research & development](#) 10% to 30%, and [education](#) similar to these in core infrastructure.

**Investment in infrastructure**

An increase in public infrastructure investment affects the economy in two ways. Firstly, in the short term it fuels aggregate demand through the short-term fiscal multiplier, and also by potential crowding-in effects on private investment. And secondly, in the longer term, there is also a significant supply-side effect of public infrastructure investment: higher infrastructure capital stock increases the productive capacity of the economy. However, inefficiencies in the public investment process, such as poor project selection, implementation and monitoring, can limit these long-term output gains, as they may hamper the creation of the necessary productive infrastructure. That can explain some counter-intuitive (no impact) and often contradictory [results](#) on the effects of infrastructure investment on long-term economic growth.

The IMF [recommends](#) a push towards infrastructure investment for economies with clearly identified infrastructure needs, efficient public investment procedures, and particularly in economies where economic [slack](#) and monetary accommodation exist. The Fund also states that [evidence](#) from advanced economies suggests that an increase in public investment that is debt financed could have larger effects on output than one that is budget neutral or financed from taxes or by cuts in expenditure (as [shown](#) by the ECB). Some research also implies that infrastructure spending has a bigger impact on growth in countries with higher initial [infrastructure stock](#).

The Commission in a 2014 paper found the link between investment in transport and electricity infrastructure and growth in the long term (provided there is no oversupply of infrastructure). Economic growth would mean more consumption of electricity, which can result in additional electricity investment which further stimulates growth. There is also research [showing](#) that infrastructure investment increases [productivity](#).

**Regional aspects of infrastructure investment**

The OECD underlines the importance of the [benefits](#) for regions from the renewal of economic infrastructure, saying that it delivers cumulative advantages. This occurs due to the resulting accelerated regional development which is fundamental to the development of economic and regional clusters, and also contributes to the growth of cities. The potential is enormous: the backlog of ageing assets needing renewal in many advanced OECD economies is [estimated](#) at US\$50 trillion around 2030. The [EIB](#) remarks that infrastructure improvements affect the geographical distribution of economic activities, and generate externalities that may be diffused very far. It is therefore crucial for the regions to coordinate both inter-regional and intra-regional infrastructure projects to avoid surprising and undesired effects on the local economy. For example, new roads linking the periphery with the core are likely to strengthen the latter and weaken the former. However, the EIB found that additional infrastructure appears to be [less relevant](#) for regional economic growth than increasing human capital and innovation.

**Investment in research and development (R&D) and innovation**

R&D and innovation are widely recognised as engines of long-run economic growth, and consequently the involvement of the state in this area is commonly [associated](#) with high long-term potential growth. Public R&D also has a [positive](#) impact on private R&D [spending](#). The example of the USA shows that publicly funded basic research can enable many [technological breakthroughs](#). Furthermore, the OECD underlines that evidence exists of the [positive impact](#) of public R&D on private-sector innovative activity, growth of total factor productivity and improving the absorptive capacity and the ability of countries to learn from new innovations worldwide.

Importantly, R&D has had a high [rate of return](#) over the past 50 years (higher than those for ordinary capital), while the social returns are even higher than private ones. This can be explained by the existence of intra- and inter-sectoral knowledge [spill-overs](#) on national and cross-border levels.

However, recent research shows that even for similar R&D programmes the results may be [different](#) in different countries. Scope for positive effects for growth exists when government support in the form of grants and tax credits reinforces projects with social rates of return substantially higher than private rates of return (identifying these is challenging though). The researcher suggests that public investment in R&D, especially in times of fiscal consolidation, could focus on incentivising new firms to engage in innovative projects, rather than investing public money in very costly expansions of existing R&D projects.

Considering investment in [high-tech](#), another paper finds success factors for individual sectors to be complementary. Therefore, investing in one success factor (e.g. broadband infrastructure) without sufficient availability of others (e.g. education) is unlikely to make that sector successful. Public investment may therefore need to be based on a holistic approach, tackling several structural barriers at the same time, but also reducing engagement in less promising fields. Such a strategic approach may improve the efficiency of allocation of scarce public capital.

### **Investment in education and health**

The literature tends to point to a stronger link with growth for public spending on human capital rather than on physical capital. Public investment in education increases the level of [human capital](#) and this is seen by many as a main source of long-term economic growth. Accordingly, positive effects of education expenditures on productivity and growth are suggested by [empirical work](#), particularly in the case of high-income countries. Strong links between increasing expenditure on health and education, and [raising long-term GDP](#) growth have also been confirmed by the OECD.

Education spending might also support economic growth by facilitating individual or social improvements and developments, or [reducing inequalities](#). A more educated labour force is more mobile and adaptable, can learn new tasks and skills easier, and can use a wider range of (new) technologies and sophisticated equipment. This also enables employers to modernise their workplaces more easily and better accommodate competitive pressures and changes in consumer demand. For advanced economies, the more educated the population of a country is already, the more beneficial for economic growth an increase in government spending on education is.

### **Regional aspects of growth-conducive investments**

Some economists believe that 'traditional' growth-friendly investments such as infrastructure, transport, education and training have started showing [returns](#) below expectations. They argue that, especially for the regional dimension, [smart specialisation](#) and innovation need to be emphasised. However, the scientific foundation and empirical evidence supporting this are uncertain. It is possible that policy support for regional growth needs to touch upon multiple domains such as infrastructure, R&D and education, but the policy mix is likely to work best when tailored to the individual characteristics of regions. In the context of formulating EU policies, the Committee of the Regions has long been advocating strengthening their territorial, place-based aspect, since two thirds of public investment in the EU is implemented at regional and local level.

According to the Commission, cost-effective and efficient health expenditure can increase the quantity and [productivity of labour](#) by raising healthy life expectancy. Human capital investment through education and health care are particularly important for economies operating at the [technology frontier](#). Health can affect income, children's education, savings and investment patterns, and demographic structure, and as such is extremely important to long-term growth. Research on a sample of European countries shows that public health and education spending is [complementary](#) to private expenditure rather than having a crowding-out effect. Interestingly, not just investment but current spending on education and health seems also to be growth-boosting.

### **Investment efficiency and quality**

Many international organisations consider good governance and strong administrative capacity as necessary preconditions to achieving growth-conducive investments. The economic and social impact of public investments depends on their efficiency, quality and the productivity of the public capital they create. The ECB shows that inefficient investments stimulate only weak demand-side effects which [diminish](#) in the medium term. The IMF compared the value of public capital and infrastructure coverage and quality across countries, and found [inefficiencies](#) in the public-investment process of around 30%. It also stressed that the most efficient public investors get twice the growth for their investment capital as do the least efficient ones. To tackle this, the IMF recommended strengthening the key institutions crucial in the planning, allocation and implementation of investments. For the advanced economies it found making fiscal and budgetary frameworks a stable base for planning across all levels of government to be crucial. Recognising the importance of improving the quality and efficiency of public investment, other international institutions such as the [World Bank](#) have also provided practical advice to governments. The [OECD](#) has issued guidelines on effective public investment/expenditure, which include the need for good governance and public administration strengthening, and promote a multi-level governance approach which increases shared responsibility and ownership at all government levels.

### **EU policies and initiatives**

Looking at the choice of investment areas on which EU policies and initiatives focus, one can conclude that, even if the text does not explicitly mention it, they are often what economists consider to be the most conducive to long-term growth. For example, the [Europe 2020 strategy](#) envisages promoting 'efficient investment in education and training systems at all levels', and 'public funding for R&D ... key infrastructure investments in cross-border energy and transport networks, and low-carbon technology.' It also explicitly mentions that 'budgetary consolidation programmes should prioritise growth-enhancing items such as education and skills, R&D and innovation and investment in networks, e.g. high-speed internet, energy and transport interconnections – i.e. the key thematic areas of the Europe 2020 strategy'. In 2014, the European Council adopted five strategic [priority areas](#) for the EU for the 2014-2019 period. The document mentions boosting long-term investments, increasing investing in human capital and 'addressing overdue investment needs in transport, energy and telecom infrastructure as well as in energy efficiency, innovation and research, skills, education and [innovation](#)'. Nevertheless, as noted by the Committee of the Regions and the OECD, budget cuts in Europe often [negatively affect](#) public investment in the same potentially growth-conducive areas (e.g. infrastructure, education, training or healthcare), particularly at the level of regions and cities.

### European Semester

Improving the investment environment in Europe has also started to play an increasing role in the European Semester. The notions of growth-enhancing/friendly public investment or spending have been used at every stage of the process. For example, [Recommendations for the euro area](#) in 2013 asked for a better reflection of the growth impact of different spending items in the composition of government expenditure as well as increasing economic growth by fostering public investment. In its [conclusions](#) on the 2014 European Semester, the Council stressed that 'more attention should be paid to giving priority to public spending aimed at increasing the growth potential'. In the [2014 Annual Growth Survey](#) the Commission recommended measures for countries with fiscal capacity to stimulate growth-friendly public investment, and urged the Member States to 'find ways to protect or promote longer term investments in education, research, innovation, energy and climate action'. In a [communication](#) accompanying the 2015 country reports, the Commission pledged to contribute strongly to narrowing the EU [investment gap](#) through 'promoting key investments that Europe needs for job-creating growth'.

In the 2016 European Semester, the focus on growth-promoting investments became even stronger: the 2016 Annual Growth Survey is accompanied by a staff working document on [challenges to Member States' investment environments](#). It summarises each country's investment profile and identifies five key challenges to investment at the national level in the following fields: public administration/business environment; labour market/education; financial sector/taxation; research, development and innovation; and sector-specific regulation. In a [communication](#) accompanying the 2016 country reports, the Commission called on the Member States to 'prioritise growth-friendly expenditure and to preserve productive public investment'. Stimulating investments for growth has also been one of the main issues addressed to individual Member States in the [2016 country-specific recommendations](#).

### The Investment Plan for Europe

The [Investment Plan](#) ('Juncker Plan') focuses, among other things, on infrastructure, innovation, education, health, energy, and information and communications technology, all of which are likely to be conducive to long-term growth. [Regulation](#) (EU) 2015/1017 on the European Fund for Strategic Investments ([EFSI](#)), which drives the Investment Plan, states that EFSI will support projects which are 'economically viable according to cost-benefit analysis', and 'promote short-, medium-, and long-term sustainable growth ... in particular where such projects have the highest incremental

#### Debate on the SGP and public investment

Many, including the [European Parliament](#) and the Committee of the Regions, have argued that public expenditure/investment related to the [implementation](#) of EU co-financed programmes should be excluded from the calculations of deficit/debt ceilings which have to stay within the limits imposed by the Stability and Growth Pact (SGP). The IMF [underlined](#) recently that public investment projects 'could have large output effects without increasing the debt-to-GDP ratio, if clearly identified infrastructure needs are met through efficient investment'. [Proponents](#) of more flexibility in the rules argue that the current strict observation of the limits of the SGP is detrimental to public investment, and impairs future growth in Europe. [Opponents](#) of increasing flexibility in the SGP argue that since public investment and the calculation of returns are not well-defined they could be prone to manipulation and possibly trigger excessive growth in public debt which would defy the purpose of the SGP. They also say that current low levels of investment are a [choice](#) of the Member States rather than an effect of the SGP. Recent [guidelines](#) on making the best use of flexibility in the SGP have provoked mixed reactions among [Member](#)

value'. In short, the [aim](#) of EFSI is to select economically viable projects in key growth-enhancing areas.

The [OECD](#) sees the opportunity for ensuring high socioeconomic returns in the fact that EFSI is managed independently and project selection has no regional, national or sectoral bias. Furthermore, the application of state aid rules should prevent crowding-out of private investment, since only high-risk projects that could not otherwise be undertaken will be supported. However, the OECD sees a challenge in the fact that projects will aim to have both social value (usually associated with lower financial returns) and a financial rate of return high enough to attract private investors. The Commission proposes to extend the lifetime of the plan beyond the three-year horizon, while MEPs seem somewhat [divided](#) in its appraisal.

#### **Determining benefits of some EU-funded projects**

In order to be able to better select projects offering good value for money and with an impact on jobs and growth, the use of [cost-benefit analysis \(CBA\)](#) as a basis for decision-making on the funding of major projects is specifically required by the EU. This concerns the co-financing of projects included in operational programmes of the European Regional Development Fund and the Cohesion Fund. CBA is 'an analytical tool to be used to appraise an investment decision in order to assess the welfare change attributable to it and, in so doing, the contribution to EU cohesion policy objectives'. The CBA aims to ensure more efficient allocation of resources, and demonstrate the usefulness for society of a specific intervention. A major project is defined as an investment operation comprising 'a series of works, activities or services intended to accomplish an indivisible task of a precise economic and technical nature which has clearly identified goals and for which the total eligible cost exceeds €50 million'.

Another example of assessing the benefits of investments in the EU context is the [economic appraisal](#) of the projects financed by the EIB. This helps the Bank to assess whether a project will contribute to economic growth and cohesion in the EU. Even if a project seems financially unprofitable the EIB considers its welfare effect and also takes a long-term perspective into account. In the field of R&D and innovation, the EIB assesses frequently 'the project's impact on the advance of the EU industry technology leadership and competitiveness and therefore its support to long-term EU economic growth', its externalities and spillovers and wider socioeconomic benefits. Furthermore, the majority of projects financed under the European Structural and Investment Funds need to provide individual verification of their financing needs similar to cost-benefit analysis. The level of detail of these analysis is determined by the managing authority which administers implementation of the specific funds.

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