

Investment as the key to recovery in the euro area?

Daniel Gros

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Key points

Investment has declined in the euro area since the start of the economic and financial crisis. But this does not mean that there is necessarily an 'investment gap'. Investment was probably above a sustainable level due to the credit boom before 2007. Moreover, the fall in the euro area's potential growth (due to a combination of a sharp demographic slowdown and lower total factor productivity (TFP) growth) should also lead to a permanently lower investment rate. Increasing the investment rate might thus be the wrong target for economic policy.

Recommendation

The aim of economic policy should be to increase consumption, rather than investment overall. Increasing infrastructure investment might be justified in some member countries, but it is not a 'free lunch' when efficiency levels are low, which seems to be the case in some of the financially stressed euro area countries.

Daniel Gros is Director of the Centre for European Policy Studies.

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The mantra in Brussels and all over Europe is that investment holds the key to recovery in the euro area. A central element of the new Commission's economic strategy is a proposed programme of investment of €300 billion. The emphasis on investment is not new,¹ but has grown in strength as the euro area seems stuck in a never-ending recession.

The general message that growth-enhancing investment is crucial for a sustainable recovery is also prominent in the public debate in many member countries, with the emphasis on how to boost investment – in particular public investment, in the case of Germany.

The underlying assumption of this emphasis is that 'more is always better', i.e. that more investment is always desirable because it increases capital stock and thus output. However, the problem with relying on investment in re-starting growth is that it might provide at most a temporary boost since the capital that has been built up today will not need to be rebuilt tomorrow. This means that boosting investment might increase demand today, but at the expense of demand tomorrow.

The IMF has recently published an in-depth analysis of the benefits of infrastructure investment, which has widely been read as implying that infrastructure investment is a 'no brainer'. A careful reading of the results of the IMF shows, however, that this is not the case everywhere.

We start by taking a brief look at the longer term economics of overall investment. The one issue

¹ See, for example, the general recommendations of the European Council to the euro area earlier this year: "Investment in the euro area fell strongly in the initial phase of the crisis and has not yet recovered to its long-term average. Sluggish investment trends are being driven by the combined impact of private sector deleveraging, financial fragmentation, and necessary fiscal consolidation efforts, which have led to a reduction in public investment. Increasing investment in infrastructure and skills is essential to sustain the recovery and boost potential growth. Much of the investment must come from the private sector, but public authorities can play an important role in creating supporting conditions" (see <http://register.consilium.europa.eu/doc/srv?l=EN&f=ST%2010808%202014%20INIT>).

not addressed in this note is what policy measures could actually have an impact on investment in the short run.

There is a huge literature on the determinants of investment, which has generally come to the conclusion that the key variable is growth (or expectations of growth) and that interest rates play at best a secondary role. One immediate implication of this, of course, is that monetary policy is unlikely to have a strong impact on investment.

1. Where is the investment gap for the euro area?

Superficially, higher investment seems always desirable. But the argument that Europe needs more investment now because its investment rate is currently lower than before the crisis is wrong on two accounts.

1.1 Investment in the financial cycle

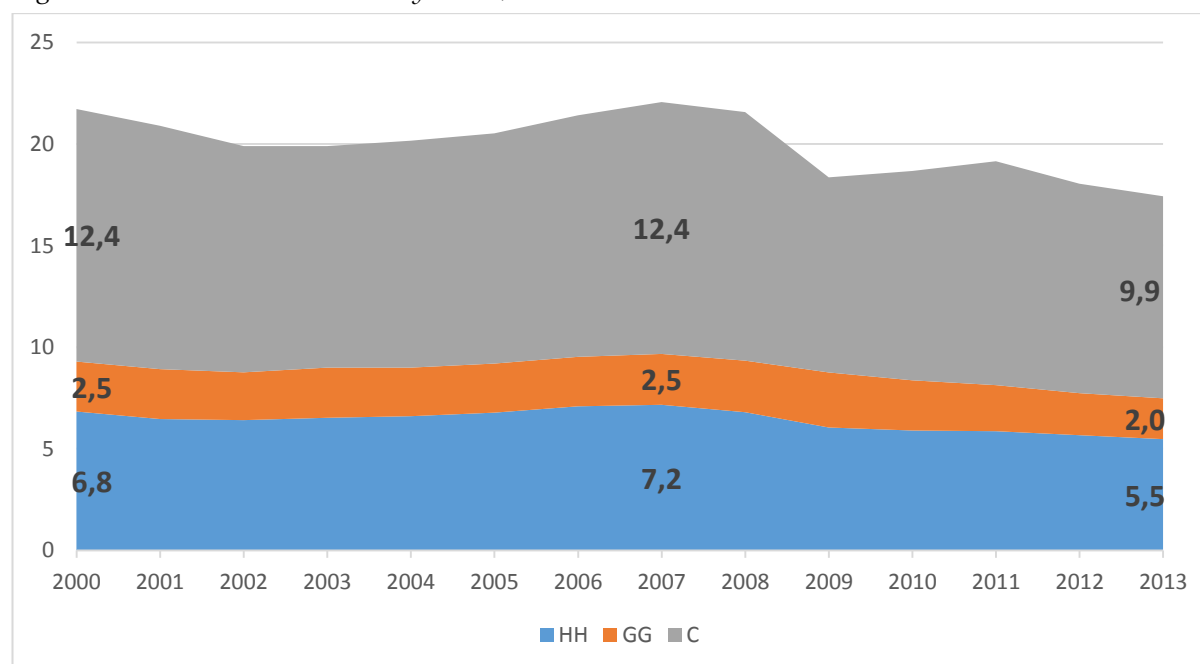
First, it is 'natural' that during a credit boom investment is high, possibly higher than warranted *ex post*, because of the easy availability of credit during the boom. Moreover, the experience of some countries proves that excessive investment in the wrong sectors (e.g. housing) will do little to create conditions for sustainable growth. Likewise, it is natural that during the bust investment falls significantly (possibly undershooting the equilibrium level) and then stabilises at a level that is lower than during the boom. It is thus not surprising that today's investment rate is lower than during the credit boom up to 2008.

Figure 1, below, shows the investment of the three main sectors as a % of GDP for the euro area. The overall investment rate is now only 17.4% of GDP, compared to over 22% at the peak of the boom in 2007, equivalent to a fall of over 4.5% of GDP (or €450 billion per annum). This is the basis for the argument that what is needed now is a recovery of investment. The chart also shows that public sector investment only plays a small role. In relative terms it fell by about the same percentage (-20%) as investment of the corporate and household

sector, but in absolute terms the contribution of public sector investment was only one-half of

one percentage point as it fell from 2.5% of GDP to 2% of GDP.

Figure 1. Euro area: Investment by sector, % of GDP



Source: Own calculations on AMECO data, HH= households, GG=general government and C= corporate sector.

The euro area had also experienced a fall in investment during 2001-02, which followed the bursting of the dotcom bubble of 1999-2000. But the present fall seems to be larger, maybe due to the 'double whammy' of the global financial crisis of 2009 and then the euro crisis, with its peak in 2012-13. One should keep in mind that the recovery of investment after 2002 must have been helped by the global credit boom. The real question is thus not whether investment should be expected to recover to its peak of 22% of GDP, but the more normal level of 20% of GDP before the global credit boom took off.

1.2 Investment and demographics

This leads to the second factor that might be holding back investment: a development that has little to do with the financial or euro crisis but by chance comes at the same time. (There is actually some evidence that large financial crises coincide with demographic turning points.)²

What is rarely recognised for Europe is how quickly demographic trends have turned recently, implying a significantly lower potential growth rate, which in turn implies that a lower (equilibrium) investment-to-GDP ratio is needed to keep the capital/output ratio constant. As shown in Box 1, *ceteris paribus*, the equilibrium ratio of investment to GDP (i.e. the ratio that keeps the capital output ratio constant) falls if potential GDP falls. Put simply: as the growth rate of the working-age population falls so does, *ceteris paribus* (assuming that TFP and other factors to not change), the potential growth rate of the economy. This implies, in turn, that a lower investment rate (investment as a share of GDP) is required to maintain a constant level of the capital-to-output ratio. If population growth falls but investment rates remain high the capital output rate would increase and the return to investment would fall. The lower return to capital would then lead over time to more non-performing loans in the banking sector.

² See Daniel Gros et al. (2013), "The Global Economy in 2030: Trends and Strategies for Europe" (<http://www.ceps.eu/book/global-economy-2030-trends-and-strategies-europe-0>).

Box 1. Steady-state capital-output ratios and equilibrium investment-to-GDP ratios

The rate of capital accumulation is determined by two key variables: investment and growth rates (and depreciation). The evolution of the capital output ratio (which describes the process of capital accumulation) can be calculated from these two variables. The so-called 'law of motion of the capital-to-output ratio' is given by the following equation:

$$\partial \left(\frac{K_t}{Y_t} \right) / \partial t = \frac{\frac{\partial K_t}{\partial t} Y_t - \frac{\partial Y_t}{\partial t} K_t}{Y_t^2} = \frac{\dot{K}}{Y_t} - \frac{\dot{Y}}{Y_t} \frac{K_t}{Y_t} = \frac{I_t}{Y_t} - g \frac{K_t}{Y_t} - \delta \frac{K_t}{Y_t}$$

Where I denote gross investment, g the growth rate of GDP and, in the last part of the equation, it is assumed that capital depreciates at a rate denoted by $K = I - \delta K$.

The time change of the capital-to-output ratio can thus be written as a function of the investment rate I/Y and the present capital output ratio:

$$\partial \left(\frac{K_t}{Y_t} \right) / \partial t = \frac{I_t}{Y_t} - (\delta + g) \frac{K_t}{Y_t}$$

This implies that one can compute the capital-output ratio at the steady state as a simple ratio:

$$\left. \frac{K_t}{Y_t} \right|_{ss} = \frac{I_t}{(\delta + g)}$$

And that the ratio of investment to GDP that keeps the K/Y ratio constant is given by:

$$\left[\frac{I_t}{Y_t} \right]_{ss} = (\delta + g) \left[\frac{K_t}{Y_t} \right]_{ss}$$

Where the subscript ss denotes steady state variables.

Given that K/Y for the euro area is close to 2.5, assuming a fall in growth from 2% to 1% would imply a fall in the steady state investment rate from 20% to 17.5%.

A higher capital stock should lead to higher output. If one takes this consideration into account the link between growth and the investment rate will be affected by the ICOR (incremental capital output ratio) or more generally the marginal productivity of capital. A simple linear relationship, which might be useful in local approximation, would be to posit that output growth is a function of the capital stock and a remainder that conflates TFP and population growth:

$$Y = \varphi K + g$$

This implies that the first equation can be rewritten as:

$$\partial \left(\frac{K_t}{Y_t} \right) / \partial t = \frac{\dot{K}}{Y_t} - \frac{(\varphi K + g)}{Y_t} \frac{K_t}{Y_t} = \frac{I_t}{Y_t} \left[1 - \varphi \left(\frac{K_t}{Y_t} \right) \right] - [g + \delta] \frac{K_t}{Y_t}$$

Where I denotes as before gross Investment and g now represents no longer overall GDP growth, but the sum of TFP and population growth (the other exogenous growth factors).

The investment rate which will keep the output ratio constant will thus be given by:

$$\left[\frac{I_t}{Y_t} \right]_{ss} = (\delta + g) \left\{ \left[\frac{K_t}{Y_t} \right]_{ss}^{-1} - \varphi \right\}_{-1}$$

Where the subscript ss again denotes steady-state variables. A higher value of φ , i.e. a higher ICOR will increase the steady-state investment rate because for any given investment rate is increases the growth rate of GDP.

If it were possible to increase the ICOR by some policy measures one could thus justify a lasting increase in the investment rate. The problem is that it is difficult to find any policy measure that would have this impact. The 'capital market union' proposed by the president of the European Commission might have, inter alia, this goal, but this can certainly not be achieved in the short run.

The numbers are stark for the euro area. Its working-age population growth (aged 20-59) is projected to fall on average by about 1.1% (p.a.) with a peak of 2.6% (!) for Spain. Moreover, if TFP also falls the overall fall in potential growth could be much more than one full percentage point. TFP growth has fallen considerably in the euro area and is now even negative. Part of this might be due to the lingering effects of the financial crisis, but even if only part of the fall in TFP growth is permanent, say 0.4% per annum, this would imply a fall in the potential growth rate of 1-1.4% per year (e.g. from 2.4% previously to 1-1.4% now).

This would then lead to a fall in the steady-state sustainable investment ratio of about 2.5 to 3.5 (percentage points of GDP). A fall in the investment rate from 19.5 to 17% of GDP (the lower bound) implies a permanent fall in investment of about 12-13%. Given that the investment rate during the credit boom was probably in excess of the steady state one has to conclude that much of the fall in investment (not only in construction) after 2008-09 will be permanent.

Moreover, if one compares the euro area to the US one finds that Europe is already more capital

intensive; and that the difference with the US is increasing (see Figure 2, below).

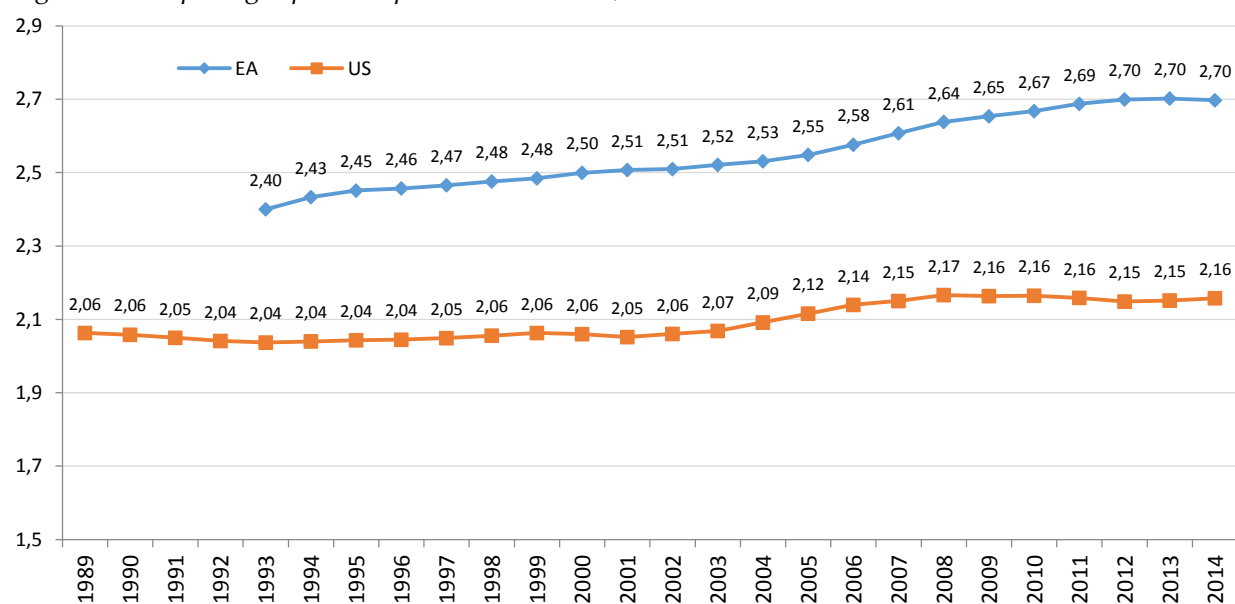
The higher investment rate in the US is justified by its much higher growth rate (both because of demographics and productivity growth). Higher investment in Europe would only lead to even higher capital-output ratios and imply lower returns to capital (with, in the end, more non-performing loans in the banking sector).

Table 1. Falling working-age population

| Growth rate working age population | | | |
|------------------------------------|-----------|-----------|---------------|
| | 2000-2005 | 2015-2020 | Annual change |
| EA4 | 3.2 | -2.4 | -1.1 |
| Individual countries | | | |
| UK | 2.7 | 0.5 | -0.4 |
| Japan | -1.9 | -2.8 | -0.2 |
| US | 5.2 | 0.5 | -0.9 |
| IT | 2.5 | -2.3 | -0.9 |
| ES | 10.5 | -2.6 | -2.6 |
| DE | -0.6 | -4.2 | -0.7 |
| F | 4.3 | 0.1 | -0.8 |

Note: Working age is defined as 20-59 years.
Source: Own calculations based on UN data.

Figure 2. Comparing capital-output ratio estimates, euro area and the US



Note: Capital is assumed to depreciate at 6% per year. Output is measured as potential GDP (based on IMF data).

Source: Authors' own elaboration based Ameco and IMF data.

This figure relates the (estimated) capital stock to potential (not actual) GDP because a recession with an output gap might distort the capital/output ratio. The comparison takes into account that the output gap is still higher in the euro area than in the US.

The data up to 2018 are, obviously, only projections. But they indicate that even with a rather modest recovery in investment the capital/output ratio of the euro area will continue to increase, implying that the return to capital would continue to fall.

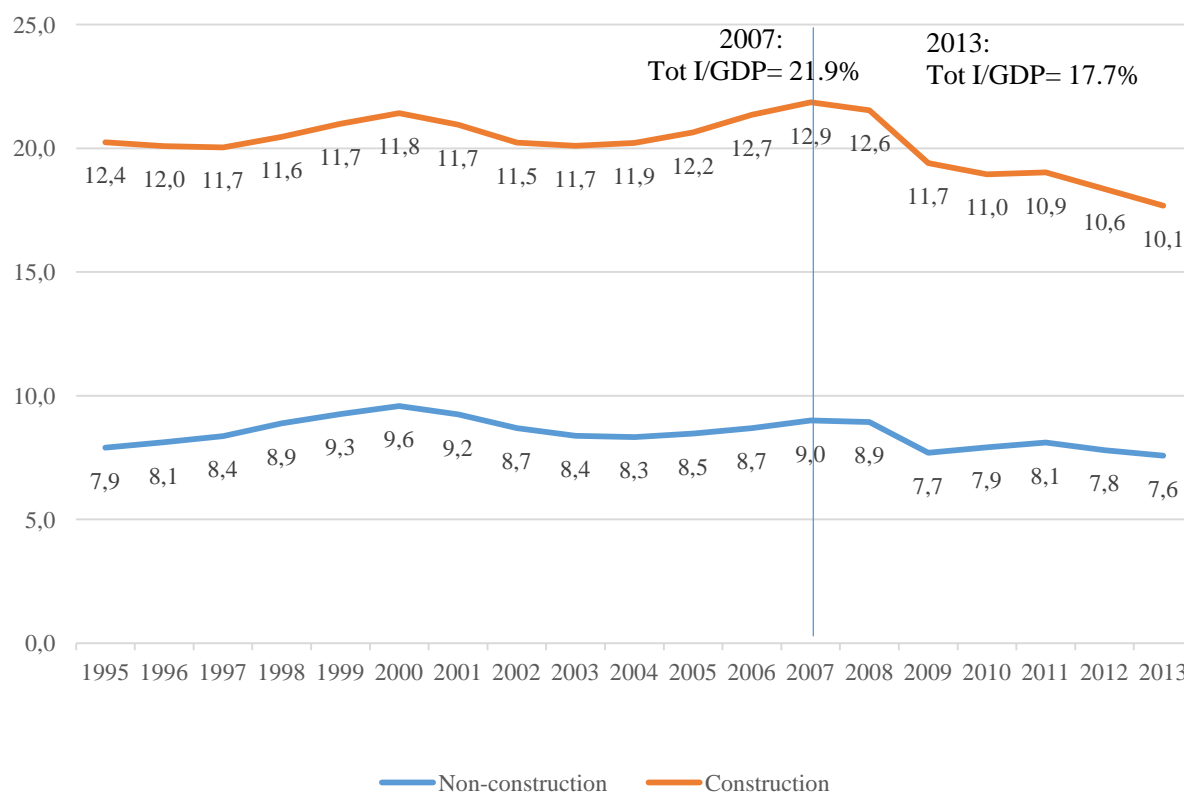
1.3 Growth enhancing investment

There are, of course, forms of investment that are more conducive to high returns and sustainable growth. The best known instance is investment in research and development (R&D), which has long been recognised by economists as having the characteristics of fixed assets. In a modern economy, R&D is an even more important investment for the future than buildings, trucks, or factories. However, although R&D is thought to be the major contribution to future economic growth (allowing for growth in TFP), R&D expenditure, – whether conducted on own account or purchased – was recorded as “intermediate consumption”, meaning that it was recorded as “completely used in the production process” at the end of the period. As a result, the balance sheet of the economy was understated, as well

as GDP and operating profits. Indeed, being considered an expense consumed at the end of the period, R&D expenditures came in deduction of the global output of the economy and of operating profits of the period. In new accounting, R&D outputs are recognised as assets and the acquisition, disposal and depreciation of R&D fixed assets will be treated in the same way as other fixed assets. The most immediate and visible impact for users will be that the level of GDP will be increased for all countries, to an amount depending on their investment in R&D. According to preliminary estimates the level of GDP will be boosted by 1.9% in Europe (weighted average of member states) and the investment to GDP will increase correspondingly. But since R&D spending has not changed much as a share of GDP in recent years this change in national-income accounting will not affect the basic conclusions drawn here.

But the basic fact remains that ‘classic’, ‘tangible’ investment, at about 17% of GDP, remains much more important than R&D (less than 3% of GDP). Moreover, as shown in Figure 3 below, most of the fall in the measured investment-to-GDP ratio since 2007-8 was due to construction investment, which fell by 2.9 percentage points of GDP (between 2008 and 2013) whereas the fall in investment in equipment (which is more relevant for future production) fell by ‘only’ 1.4 percentage points of GDP.

Figure 3. Investment as % of GDP in the euro area



Source: Ameco.

2. Is infrastructure investment a 'no brainer'?

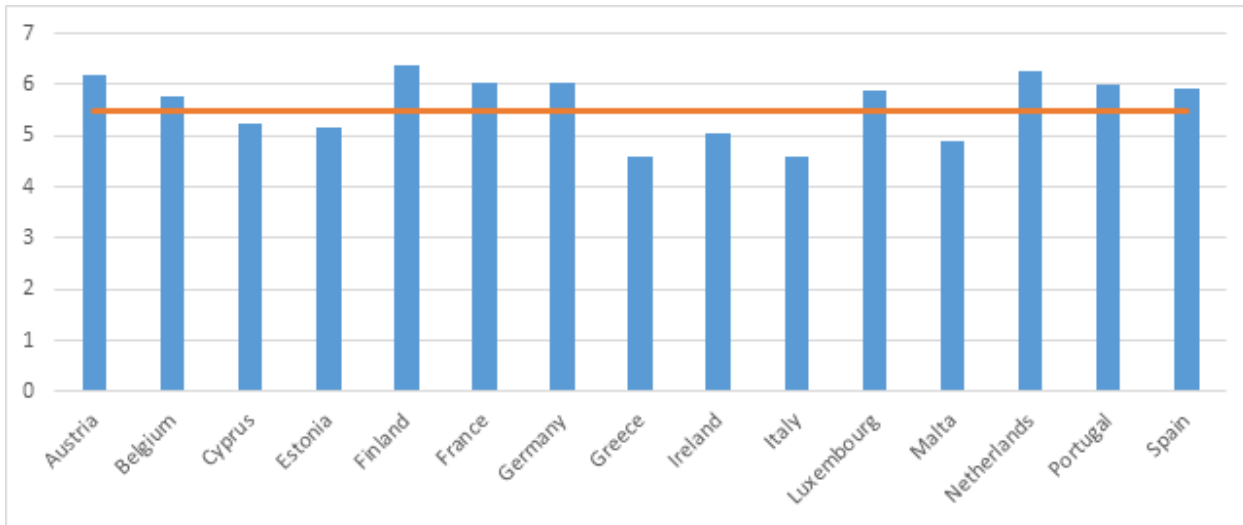
The October 2014 World Economic Outlook (WEO) of the IMF contains a special chapter on public investment in infrastructure. The main thrust of the analysis is that infrastructure investment increases output (over time) so that even a debt-financed increase in expenditure lowers the debt/GDP ratio. This is because the increase in GDP is large enough to offset the higher debt needed to finance the investment itself. However, the analysis also shows that this is the case only for countries classified as 'high efficiency', i.e. countries in which over the past, higher infrastructure investment has translated into a better quality infrastructure (as measured by a World Economic Forum (WEF) indicator). For 'low efficiency' countries the opposite holds: higher infrastructure spending leads to an

output path below the baseline. This is explained by the fact that infrastructure investment in low efficiency countries is basically just wasted. The other result is that for such countries higher spending on infrastructure leads to a sharp increase in the debt/GDP ratio.

The prescription to increase infrastructure spending is thus valid only for high efficiency countries. In the concrete case of the euro area one finds that France, Germany and Spain are classified as 'high efficiency'. However, Italy, Greece and Slovakia are low efficiency and should thus not be asked to increase spending.

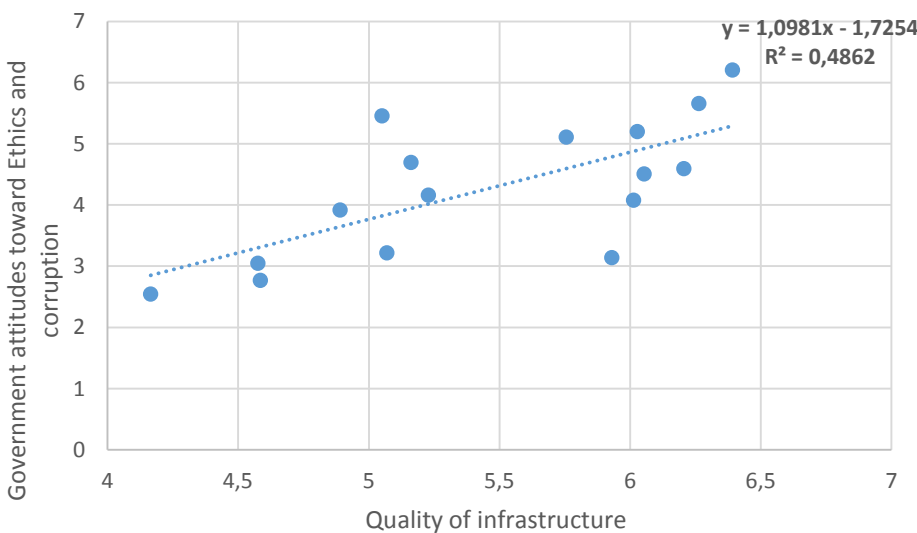
As one would expect, there is also a clear correlation between the WEF indicator of (the absence of) corruption and the quality of infrastructure, again of the WEF.

Figure 4. Quality of investment, selected euro area countries



Source: World Economic Forum, Global Competitiveness indicator.

Figure 5. Relationship between (inverse measure of) corruption and quality of infrastructure



Source: World Economic Forum database.

3. Concluding remarks

Calling for more investment is superficially always attractive. However, there are fundamental reasons to believe that the investment rate in the euro area will remain permanently depressed. The investment gap so often invoked is anyway much smaller than widely believed because any comparison with the peak level reached at the peak of a credit

boom in 2007 is inappropriate. But investment rates in the euro area are likely to remain below the more normal levels of before the credit boom because the potential growth rate of the euro area has declined so much under the twin impacts of lower labour force growth (now turning negative) and a fall in overall productivity (a longer term trend whose root cause is difficult to ascertain).

It might be possible, through certain policy measures, to bring some investment plans forward, but this would come at the expense of lower investment in the future if the capital stock is to remain appropriate to the level of output that can be expected in a low-growth environment. Moreover, the experience in countries with relatively high investment rates, but low growth, such as Italy, has shown that keeping investment up when potential growth remains anaemic leads, over time, to the accumulation of non-performing loans in the banking sector.

The facile counterargument is that investment in southern Europe, including Italy, was ‘mal invested’ during the boom years, implying that Italy and other financially stressed countries might have relatively high stock of capital, but of the wrong type (housing and other non-tradable activities) and that high investment is needed to give the economies of the South the capital needed for a new type of growth. However, it is unlikely that a higher rate of investment in countries like Italy will lead to a much higher productivity today (i.e. a higher incremental capital output ratio – ICOR) unless the financial system is radically changed.

Authors Manove, Padilla and Pagano (2001) show how ‘lazy banks’ that place too much emphasis on collateral might not screen investment projects for their profitability. An

excessive emphasis on collateral might have been at the root of the low productivity of investment in Italy. There is no indication that this has changed recently. If anything, banks might now have become even more prudent.

The conclusion is that European policy-makers should focus on increasing consumption, rather than harping on about more investment. The recoveries in the US and the UK have indeed been largely driven by consumption, which has recovered in the US on the back of stronger household balance sheets. A recovery in investment has followed a resumed growth in consumption.

References

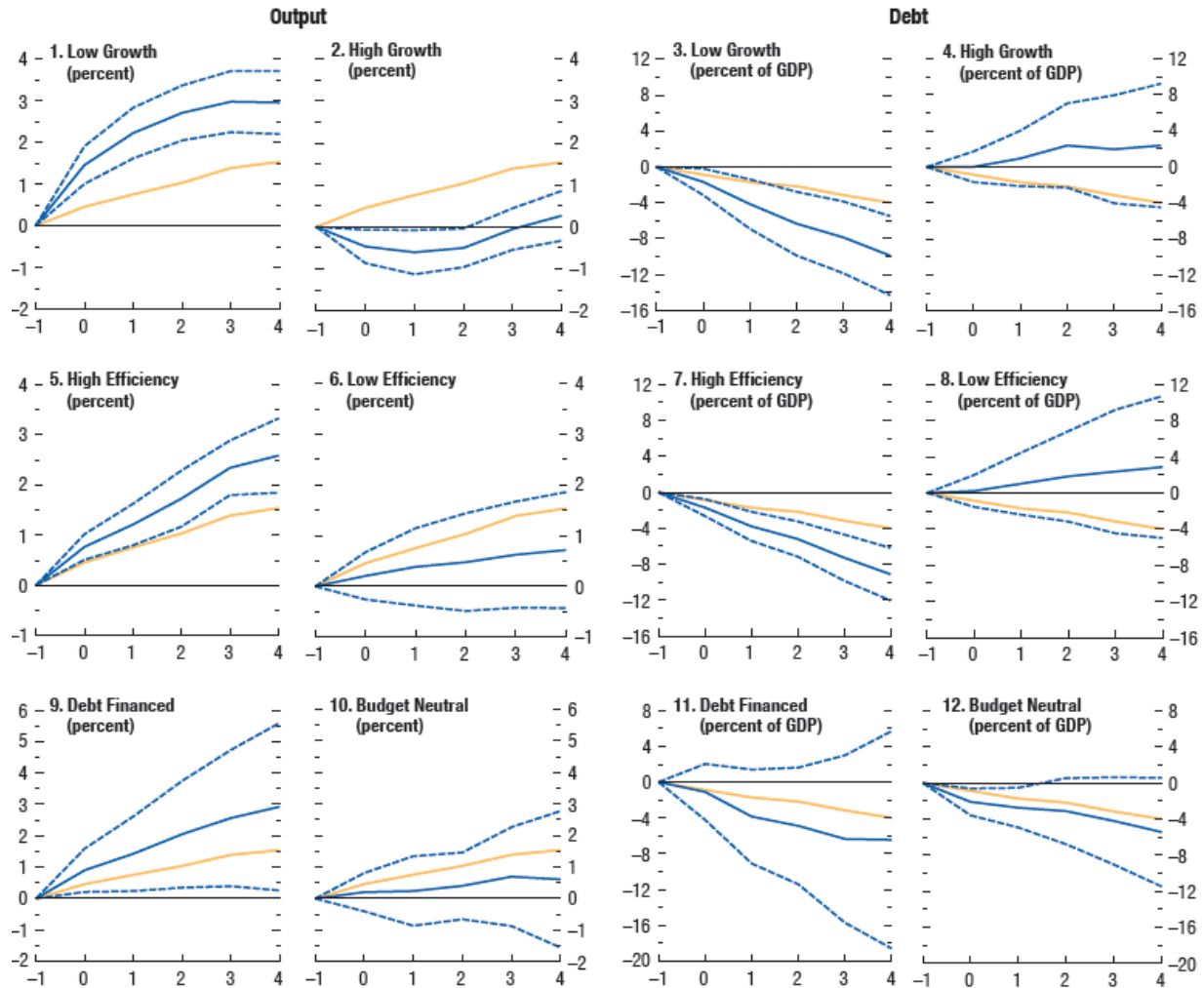
IMF (2014), World Economic Outlook, October (<http://www.imf.org/external/pubs/ft/weo/2014/02/>).

Gros, D. (2013), “Why does capital flow from poor to rich countries?”, Voxeu.org, 26 August (<http://www.voxeu.org/article/why-does-capital-flow-poor-rich-countries>).

Manove, M., A. J. Padilla and M. Pagano (2001), “Collateral vs. Project Screening: A Model of Lazy Banks” (<https://ideas.repec.org/p/sef/csefwp/10.html>).

Annex 1. Extract from the World Economic Outlook of the IMF, October 2014

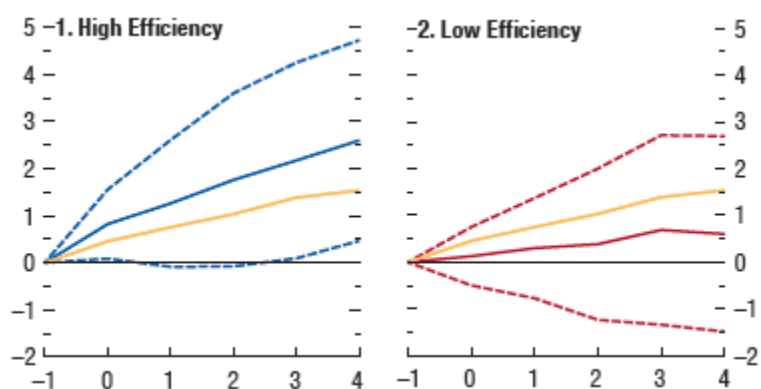
Figure 6. Effect of public investment in advanced economies: Role of economic conditions, efficiency, and mode of financing



Note: $t = 0$ is the year of the shock; dashed lines denote 90 confidence bands. Solid yellow lines represent the baseline result.

Source: IMF World Economic Outlook, October 2014, p. 84.

Figure 7. Model simulation results. Effect of public investment shocks on output: high versus low efficiency



Note: $t = 0$ is the year of the shock; dashed lines denote 90% confidence bands. Blue lines represent high efficiency; red lines represent low efficiency; yellow lines represent the baseline. Shock represents an exogenous 1 percentage point of GDP increase in public investment spending.

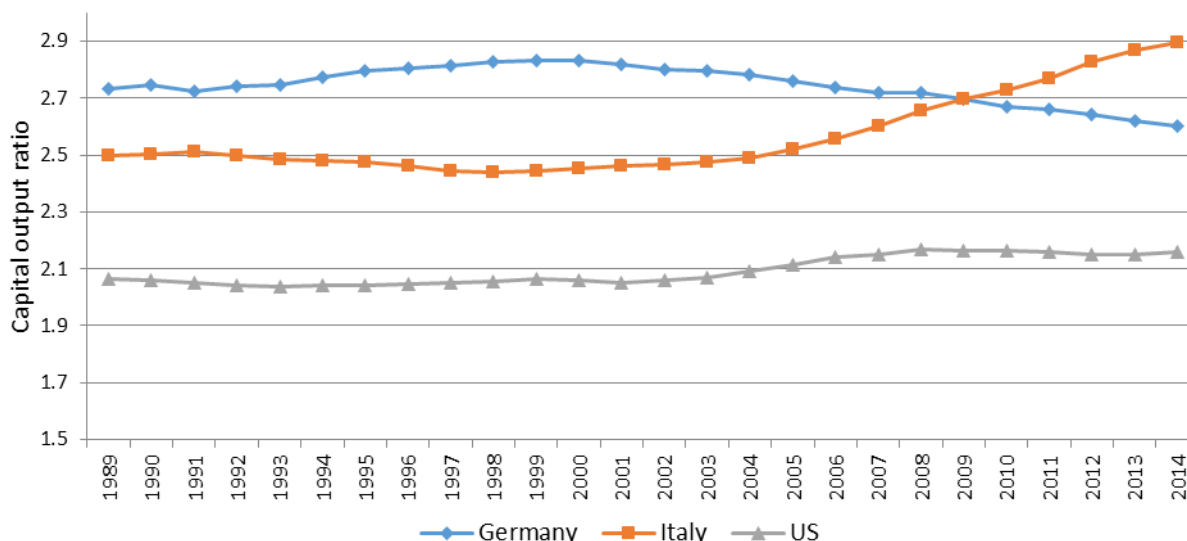
Source: IMF World Economic Outlook, October 2014, p. 96.

Annex 2. Capital output ratios in two key euro area countries vs the US

It is interesting to consider the capital output ratios of two key countries: Germany and Italy. The German capital output ratio used to be much higher than that of Italy, but it started to decline around the start of EMU, leading to much handwringing about the future of Germany as an industrial economy. The decline accelerated with the (German only) recession in 2003, around the same time the public state guarantee for the Landesbanken/Sparkassen system was terminated under pressure from the European Commission (Commissioner responsible Mario Monti). This decline in the German investment rate was one of the contributing factors to the emergence of the German current account surplus.

In Italy, by contrast, investment stayed relatively high until 2010, leading to a steady increase in the capital output ratio given the low growth rate of the country. This trend has continued more recently (and is projected by the IMF to continue) because a slightly lower investment rate has been more than compensated by an even lower growth rate. This figure also relates the (estimated) capital stock to potential GDP. The comparison between Germany and Italy is thus distorted by the fact that Italy has a very large output gap.

Figure 8. Capital output ratios



Note: Capital is assumed to depreciate at 6% per year. Output is measured as potential GDP (based on IMF data).

Source: Authors' own elaboration based Ameco and IMF data.

That relatively poor countries can have higher capital output ratios is not a phenomenon only of the Eurozone. For example, the capital output ratio of China is much higher than that of the US. This implies that the (average) productivity of capital is higher in the US than in China. It thus makes sense that capital flows from China to the US and not vice versa as observed by Gros (2013). A similar observation applies to the euro area where it is generally assumed that capital should flow from the North (Germany) to the South (Italy, Spain, etc.). However, with the German capital output ratio now much lower than that of Italy this is not necessarily the case.