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Case for higher investment in infrastructure – despite questionable “gap analysis”

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Claims have been making the rounds that it would be in Germany's own interest if it were to finally boost investment at home. The story goes that it would also stimulate eurozone growth and even the global economy. Some economists have asserted that Germany has a large investment gap, and this has been eagerly lapped up by a grand coalition of lobbyists from a wide variety of camps.

Profit-oriented companies only refrain from investing if the expected return on investment is too low. The current weakness of investment activity is a result of sluggish global growth. Moreover, the investment decisions of multinational companies are probably being influenced to a large extent by the shift in global growth centres to Asia and the US. This is attributable to demographics and economic catch-up processes. Germany's appeal as a place for doing business has been dented additionally by recently-adopted policies. How dependent investment is on the business cycle and the right circumstances is obvious from 2006 and 2007 when investment in machinery and equipment increased at double-digit rates.

Public capital stock – consisting mainly of public infrastructure – has been in decline since 2002. The evidence of the poor condition of Germany's bridges and roads in some cases is more than just anecdotal. However, it is virtually impossible to conclude that this situation indicates a general investment gap running into the billions of euros. Therefore, there is probably a positive correlation between the size of the identified gap and the (economic) interests of the person identifying it.

It is impossible to calculate what would be an optimum level of public capital stock. International comparisons are of no help owing to structural differences and overinvestment in many countries in the past decade. A comparison over time in Germany is not any better given the reunification boom and the privatisation of major investors (such as Deutsche Bahn and Deutsche Telekom).

These reservations notwithstanding, if one were to take Germany's public capital stock in 2002 as a benchmark, Germany would have to boost investment by about EUR 5 bn per year to prevent a further decline and by about EUR 10 bn in order to reach the 2002 level again in the next 10 years.

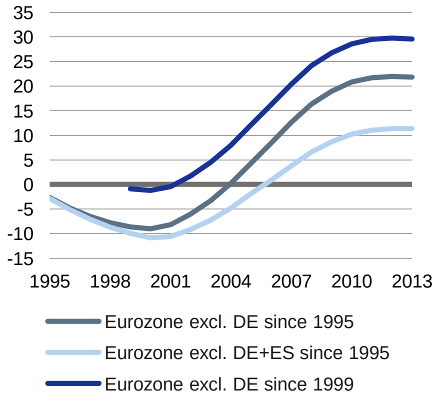
A EUR 10 bn increase in public investment in infrastructure would raise the level by roughly one-third, but ultimately this equals only 0.4% of GDP and thus amounts to less than the cost of the pensions package. As Germany's infrastructure is already highly developed (saturation effects) this would not trigger noticeable effects on Germany’s potential growth nor stimulate Europe's problem countries.

Resolute elimination of bottlenecks and higher spending on maintenance investment in particular are urgently needed to underpin potential growth. However, economic reforms would secure considerably higher and sustainable effects on growth.

Case for higher investment in infrastructure – despite questionable "gap analysis"

Which investment gap exactly? 1

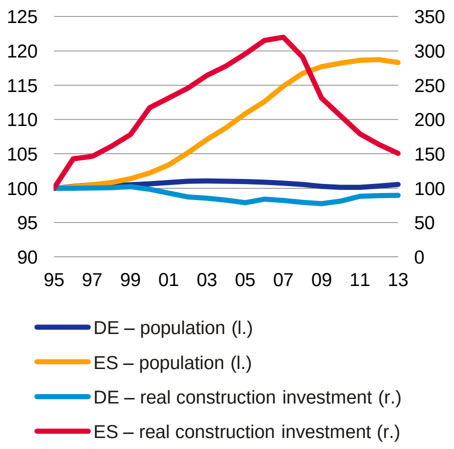
Cumulative difference between Germany's investment ratio and ..., % of GDP



Sources: Deutsche Bank Research, Eurostat

Spain: Population and construction investment grew strongly 2

1995=100



Source: Eurostat

Germany is constantly being accused of investing too little.[1] Critics say this hurts Germany itself as well as other countries. This assertion enjoys broad support among (high-profile) economic researchers, international institutions such as the IMF and many lobbyists from the German business community. They see the extra public investment requirements running to 3% of GDP (per year!), with the going buzzword being the "investment gap". The government, in particular, has been called upon to significantly boost its investments in infrastructure. Even the disappointing GDP figures and lowered growth expectations of the past few months are now also being used to justify demands for a rapid increase in (public) investment. Hopes of growth stimuli for the neighbouring countries of Europe are playing a key role in many of these demands – especially at the high end of the demand scale.

What is the optimum investment ratio? There is no such thing

The identification of a gap assumes that it is possible to determine an optimum investment level. Economic theory does not offer any such concept.

It is of little help to look at overall investment ratios (private and public sector) in other countries or at average readings in the EU or OECD for guidance, because here too it is unclear whether they represent an optimum, and this would probably be country-specific and thus not applicable to Germany anyway. If such comparisons are also based on a brief period that is dominated by extraordinary developments they will only be misleading.

If, for example, investment activity in Germany is compared with that in the eurozone (excluding Germany) a "gap" of nearly 30% of GDP[2] has developed – in strictly notional terms – from 1999 onward, since Germany reported a lower investment ratio during this period than the other eurozone countries. However, if this comparison starts in 1995, when Germany had a much higher level of investment on account of reunification, the gap narrows to just over 20%. If Spain (and its overheated housing market) is also stripped out of the eurozone figures, the gap since 1999 comes to just under 20% of GDP, and from 1995 to just over 10%. Gross fixed capital formation shot up to over 31% of GDP in Spain in the mid-2000s, driven by low interest rates, huge capital inflows and high population growth.

Moreover, differing starting levels, in Germany and the US after the Second World War for instance, are pivotal for investment growth and thus for the size of investment ratios. The same holds true for catch-up processes such as those witnessed in Spain and Portugal following their accession to the European Union in the mid-1980s.

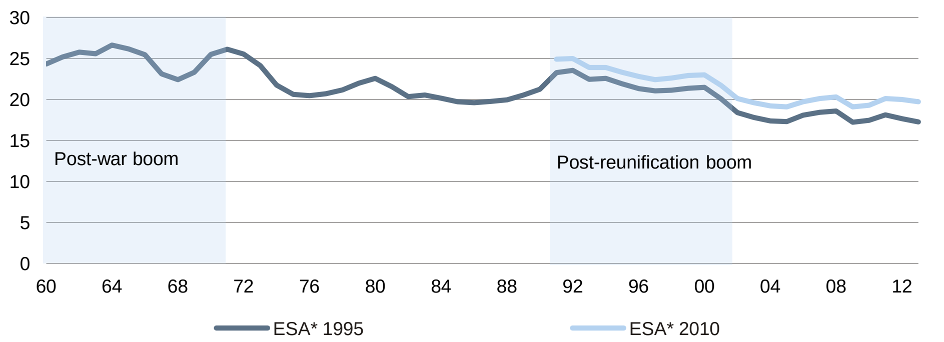
Moreover, substantial structural differences exist even among the major developed economies in terms of product range and production structure, which in turn are shaped by, inter alia, the demographic trend and the skills of the labour force. Ultimately, differing investment ratios emerge as a result. Furthermore, the political environment and/or the changes in the same (such as the "Energiewende", or Germany's transition to renewable sources of energy) also play a key role.

[1] See Bach, S. et al. (2013). More Growth through Higher Investment. DIW Economic Bulletin 8 / 2013. Baldi, G. et al. (2014). Weak Investment Dampens Europe's Growth. DIW Economic Bulletin 7 / 2014. or IMF (2014). Germany. Staff Report for the 2014 Article IV Consultation.
[2] Figures are based on the national accounts according to the new ESA 2010 standard. In fact, according to the old definition the "gap" was 40%.

Using a country's own historical performance or historical averages as benchmarks also harbours potentially serious pitfalls on account of extraordinary developments, such as Germany's reunification and Energiewende, and therefore provides little substance for assessing the more recent past. Gross fixed capital formation's share of GDP in Germany had been trending down since the 1960s, which is not surprising considering the extremely high investment requirements in the post-war period; however, this trend appears to have stopped around 2000. At the beginning of the 1960s the investment ratio still topped 25% and had fallen to roughly 20% by the mid-1980s. During German reunification and the related construction boom it temporarily resumed its climb to over 23% before returning to a downtrend until the start of the 2000s. Since 2000 it has hovered at around 20%, fluctuating slightly.

Fixed capital formation: Downtrend stopped in early 2000s 3

Germany (% of GDP)



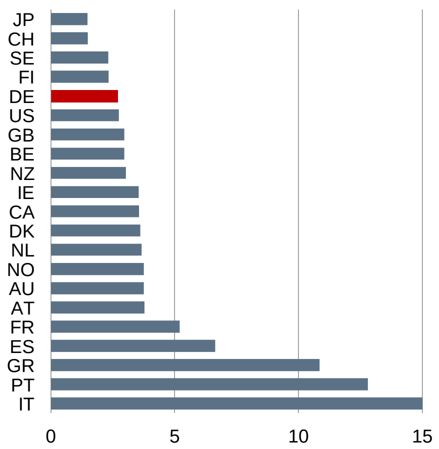
*Differing definitions of GDP. New standard classifies R&D expenditure as investment.

Sources: Eurostat, AMECO

Lastly, demographic developments also play a major yet largely neglected role. Together with the Baltic states Germany has shown the weakest population growth by far. Since the mid-1990s, population growth in Germany has been virtually flat while having increased in, say, Ireland by over 20%, Spain by nearly 20% and France by no less than 10% or so. This explains a quite substantial part of the higher (construction) investment in these countries. Despite the recent surge in immigration to Germany there has been no fundamental change in Germany's population prospects: the number of Germans will probably start to decline noticeably over the next few years, while the population of France, for instance, is likely to continue growing.

High efficiency rating for investment in Germany 4

Average net investment ratio divided by average GDP growth from 2000 to 2013 (ICOR index*)



*The lower the index value, the more efficient the investment

Sources: European Commission (AMECO), Deutsche Bank Research

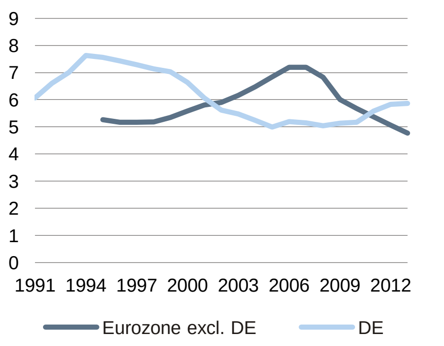
Germany invests efficiently, and more in machinery and equipment than others

High investment ratios alone say nothing about profitability. As regards the efficiency of investment, Germany ranks near the top of the international table for the 2000 to 2013 period as measured by the ICOR Index. The ICOR Index (Incremental Capital Output Ratio) sets investment activity in relation to GDP, in this case the net investment exceeding replacement investment in relation to economic growth achieved. The lower this index reading, the more efficient is the investment. This comparison shows that by international standards Germany has achieved high GDP growth with its investments.

On the one hand, the quality of the labour supply probably plays an important part. On the other, the investment target is also important. Investments in machinery and equipment, for example, consistently made up a higher share of GDP in Germany than in the rest of the eurozone – among other things this reflects the higher share of manufacturing in Germany (roughly 20%; eurozone: 14%; France: roughly 10%). For investments in intellectual property (R&D) the countries run roughly neck and neck. By contrast, the ratio of construction investment in Germany has occasionally fallen noticeably below the eurozone ratio. Investment has a direct impact on growth since it is a component of GDP. Investment in machinery and equipment has a much larger impact on growth potential than investment in construction does though, particularly when construction focuses on housing. In other words: investment in machinery and creative minds beats investment in bricks and mortar.

Investment in residential construction 5

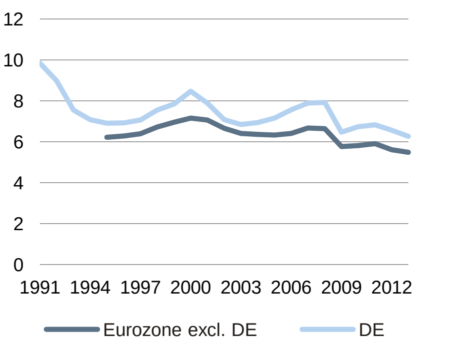
% of GDP



Sources: Eurostat, Deutsche Bank Research

Investment in machinery & equipment 6

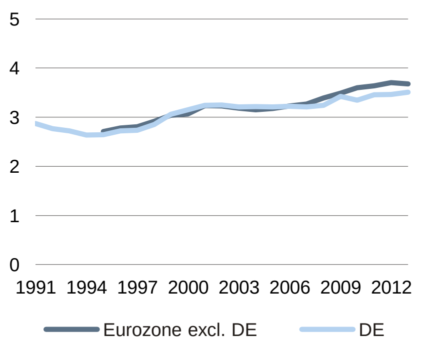
% of GDP



Sources: Eurostat, Deutsche Bank Research

R&D investment 7

% of GDP



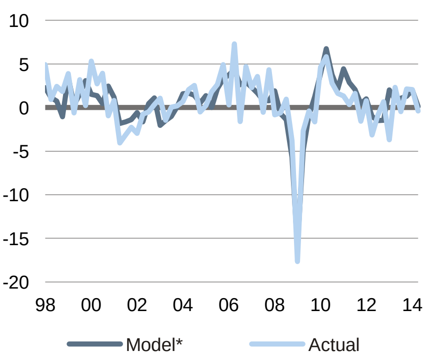
Sources: Eurostat, Deutsche Bank Research

Sluggish corporate investment: Curbed by cyclical factors and economic policy

Given the difficulties discussed, we believe that the concept of an investment gap is of little value. True, international and historical comparisons may certainly provide a reason to conduct deeper analysis. However, seeking to derive quantitative targets does not do justice to the complexity of corporate and government investment decisions. Moreover, the word "gap" suggests that this merely has to be plugged with money in order to solve the problem. This is to be doubted with regard to corporate investment in particular. Private investments are made by profit-oriented firms that ought to know better than politicians (or economists) not only how much they want to invest, but also where and when. Corporates are not immune to making wrong decisions by any means. However, the development of a macro-economically relevant investment gap assumes that companies continually make flawed decisions and, for example, are not driven out of the market by the market entrance of domestic or foreign competitors in Germany.

Investment in machinery & equipment: Where is the underinvestment? 8

% yoy



*Model factors in real interest rates, capacity utilisation

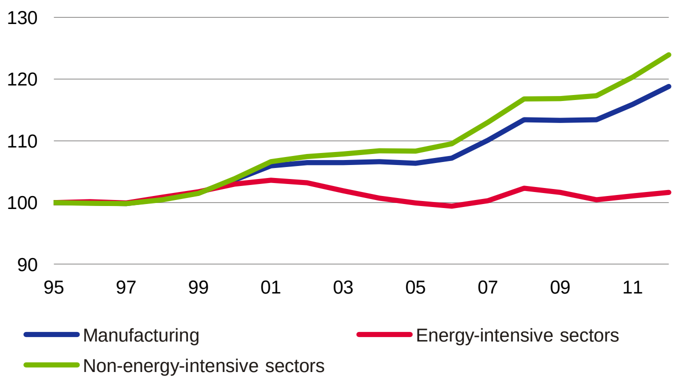
Sources: Federal Statistical Office, Deutsche Bank Research, ifo, Datastream, Global Insight

In our opinion, the currently sluggish state of private investment activity is partly to be explained by the weakness of global growth dynamics. For instance, growth in the eurozone in particular has fallen far short of the pre-crisis trend over the past few years. This has noticeably impacted German exports and resulted in low capacity utilisation, which in turn has gone hand in hand with weak investment (in machinery and equipment). The now pronounced uncertainty over the outcome of the euro crisis has also fuelled the reluctance to invest. However, to interpret this as flawed decision-making by companies seems rather audacious. The adjoining chart shows that key activity indicators can explain over 60% of the fluctuation in actual investment. This applies not only to the past few years but also to the entire period under review.

Moreover, German investments are curbed by structural factors such as the demographic challenge. The latest economic policy measures have only been a further deterrent for investors. The reforms will shrink the labour pool (retirement at 63) in the near term and drive up social security contributions (pensions package) as well as structural unemployment (minimum wage) in the medium term.[3] On top of this, the Energiewende has noticeably reduced the investment activity of Germany's energy-intensive companies over the past ten years because of higher energy costs.[4] Moreover, uncertainty continues to reign over the future regulatory environment – Energiewende 2.0 has failed to produce satisfactory answers. Even before the current government came into power too little was being done to implement reforms. It is just as arbitrary a task to quantify reform gaps as it is investment gaps. Nonetheless, the chart below clearly shows that Germany has virtually ceased to push for reforms since at least 2009. It is understandable that coping with the euro crisis had taken priority and tied up considerable political resources. But it is now time for economic policy to assume a bigger role again.

Energy-intensive companies reluctant to invest 9

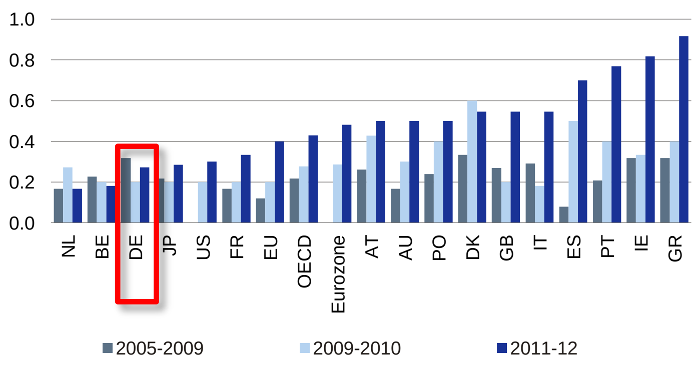
Net fixed assets, 1995=100



Sources: Federal Statistical Office, Deutsche Bank Research

Little reform activity in Germany since 2005 10

OECD reform responsiveness indicator



Source: OECD (Going for Growth)

Need for more investment in public infrastructure, but how much?

A consensus has formed among politicians and experts, one which we endorse, that the German government ought to scale up its investment in (transport) infrastructure. This debate has recently regained some momentum thanks especially to Germany's positive budget situation – by European standards – and the weakening dynamics of GDP growth. The volume of the investment necessary is still at issue, however, and we think that the alarmist views being spread are in some cases quite exaggerated.

Anecdotal evidence of weaknesses in German infrastructure is easy to find and is willingly taken up by the media: some estimates say 6,000 of Germany's 39,000 bridges are in a state of disrepair which often leads to road closures at least for goods traffic and thus necessitates major detours.[5] 40% of all bridges are said to be over 100 years old. In addition, there are some heavily frequented, often faulty waterway locks which in some cases date back to Imperial Germany. Last but not least, criticism is often levelled at the poor links between Germany's seaports and the rail network, and these are cited as examples of gaps that need to be plugged.

3 Peters, H. (2014). Strong domestic economy to suffer from good intentions. Focus Germany. June 2014.
4 Slomka, L. et al (2013). Energiewende 2.0 – don't risk competitiveness. Standpunkt Deutschland. November 2013.
5 Eine Milliarde für 78 Autobahnbrücken. FAZ.net. September 20, 2014.

However, these criticisms are countered by an unbroken string of good scores in international rankings. Long before and during the crisis period, Germany was praised from all quarters for its good infrastructure and the related positive investment climate. Have the facts changed so quickly, or is jumping on the investment gap bandwagon simply en vogue? Germany's infrastructure regularly achieves excellent scores in the rankings of the World Economic Forum. In the current ranking, Germany trails Hong Kong and Singapore to claim 3rd place, still coming in ahead of France, while the US merely ranks 10th. Admittedly, Germany has fallen back two places in relation to the 2009/10 ranking, when it still led the field. This indicates a need for action especially with regard to road quality. Germany's assessment here has deteriorated by 6 notches, to 11th place, while France has not budged from 2nd place. But Germany's ranking according to the World Bank's "Logistics Performance Index" does not point to general infrastructure deficiencies either. Germany holds 1st place in the current ranking (2014); in the infrastructure subcategory it also ranks 1st, as it did back in 2012.

The foregoing suggests that overly hasty action to launch an investment programme is out of place. Instead, the government ought to gradually make up for the underinvestment of recent years and end the ongoing underfunding.

As with total investment it is not possible to determine the optimum investment level for the general government, and a comparison of investment ratios is fraught with many problems. International comparisons, for instance, are out of the question because the overinvestment and catch-up activities in many countries over the past few years distort the statistics to the upside. A comparison of public investment in Germany today with that of earlier decades paints a much too negative picture on account of "Aufbau Ost", the programme to bring the east German economy up to west German standards. At the end of the day, the government should assess each investment on its individual merits.

Government should boost investment by EUR 5-10 bn per year

There are also studies not based on investment ratios which conclude that the German government should invest more in its infrastructure.[6] In public debate, though, amounts going into the billions are mixed up with abandon. When comparing frequently-cited reports or figures quoted from them it must be taken into consideration that the data are in some cases based on differing time periods (annual extra requirements, total requirements, backlog requirements) or differing definitions of infrastructure (total infrastructure incl. energy networks or only road infrastructure). Moreover, the analytical approaches range from surveys and bottom-up estimates through to top-down models. In some cases, the figures only focus on public investments, while in other cases target figures also cover infrastructure components that are largely funded by the private sector. In grossly simplified terms, these studies see extra public investment requirements running to EUR 7-15 bn; in our opinion, the studies with totals at the lower end of this range are based on more serious analysis. Without exception, these studies lay the emphasis on maintenance investment. Given the demographic outlook and the extent of existing infrastructure the need for extending the German infrastructure stock is limited and focuses on plugging gaps.

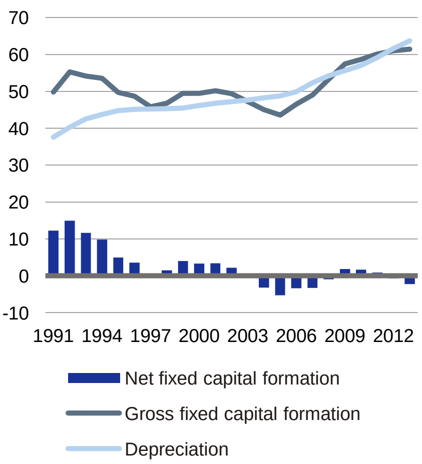
Using numbers for public gross fixed capital formation and the related depreciation on this investment it is at least possible to check the given totals for consistency. We confine our calculations to non-residential construction, which is closest in nature to public transport infrastructure. Since 2003 the government

6 For a detailed discussion, see: Gräf, B. and O. Rakau (2014). Ice bucket challenge and structural investment gap. Focus Germany. September 2014.

has reported less gross investment in this construction segment than it has written off (negative net investment implies a decline in the capital stock). On average, net investment totalled minus EUR 5.0 bn from 2003 to 2013. In 2014 depreciation exceeded investment by EUR 6.8 bn. On a cumulative basis the "gap" totals EUR 55.2 bn. The public capital stock shrank by this sum within 11 years. This was attributable to construction investment alone. By contrast, the public sector invested heavily in net terms in machinery and equipment as well as in intellectual property. If this is factored in, the gap would total only EUR 15 bn. Generally, this argumentation assumes that the public capital stock was at an optimum level in 2002 – an arbitrary assumption as it is also based on a comparison of ratios.

Public net fixed capital formation: Higher depreciation weighing heavily … 11

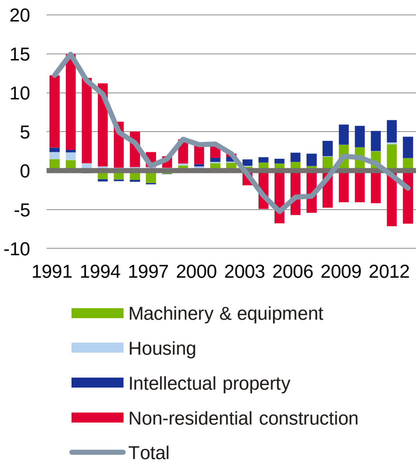
EUR bn



Source: Federal Statistical Office

… especially on recently weaker investment in non-residential construction … 12

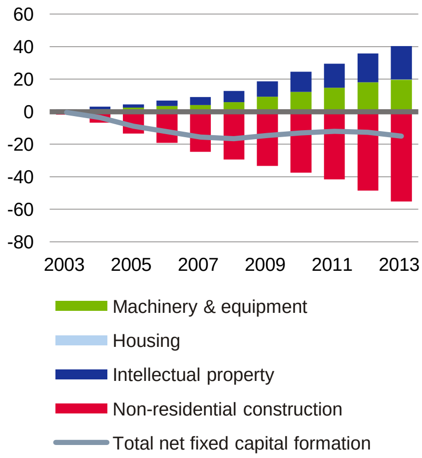
EUR bn



Source: Federal Statistical Office

… while other investments are adding to capital stock 13

EUR bn, cumulative values since 2003



Sources: Federal Statistical Office, Deutsche Bank Research

A declining capital stock and/or a lower public-sector investment ratio could also be partly explained by the fact that the migration flows to urban conurbations are unbroken, that more efficient use of public capital is possible there and that demand in rural areas is falling. Probably another reason for the low level of public investment in construction is the declining and comparatively low number of public-sector employees in Germany, which is a sign of a differing division of tasks between the government and the private sector in Germany and France. The public sector's share of employment in France is about 21.9%. In Germany, by contrast, it is only 10.6%. This is due to France's numerous administrative levels combined with a large number of very small municipalities (that have 1,800 inhabitants on average as opposed to Germany's 7,100), and this obviously goes hand in hand with corresponding investment in construction. The municipalities' share of investment has fallen in Germany, although this has been strongly influenced by privatisation in the waste disposal segment. Investment in this segment was equivalent to 0.45% of GDP back in 1992.[7]

Given these considerations and the already-cited reports, it appears plausible to us that the extra investment required annually by the public sector to maintain the public (transport) infrastructure in particular would total between EUR 5 bn (stopping further decay) and EUR 10 bn (additional catch-up maintenance investment to shore up infrastructure over the next 10 years). This additional public investment would equal between nearly 0.2% and almost 0.4% of GDP.

7 See also: German Council of Economic Experts (2014). More confidence in market processes. Annual Economic Report 2014/15.

Given the numerous limitations of the analyses we would, therefore, tend to favour the lower bound of the indicated range.

Underfunding is a political challenge

Germany's well-developed infrastructure has always been and remains an important reason for many companies to invest there. Public infrastructure is an intermediate good for all enterprises. Well-developed infrastructure at least partly compensates for poorer starting conditions on other location factors such as the German tax and levy burden. Therefore, maintenance of infrastructure is one of the government's most important tasks, and it should resolutely cover the – in our opinion – existing extra public investment requirements.

Finance Minister Schäuble recently proposed that the federal government should invest an extra EUR 10 bn – i.e. just over EUR 3 bn per year – in infrastructure from 2016 to 2018. Since the proposal was said to have been coordinated with both Chancellor Merkel and Economy Minister Gabriel, it will probably find its way into the draft federal budget for 2016 in some form. The conviction had already taken root in the political sphere that investment should increase. So this is not an abrupt volte-face – as some people claim. Compared to our proposals and the calls being made by other economists and observers, though, the totals now being discussed by the federal government are only a start. Nonetheless, not only the federal government but also the Länder and the municipalities bear responsibility for finances.

From a macroeconomic perspective, even EUR 10 bn per year over 10 years is a "drop in the bucket" (<0.4% of GDP per year) and equals less, for example, than the cost of the pensions package already adopted. However, it is still very much a political and budgetary challenge. Compared with the current annual volume of public infrastructure investment of roughly EUR 30 bn this would be a huge increase. In addition, investments in infrastructure are made at all levels of government. Many municipalities and Länder will probably find it very much more difficult than the federal government to boost investment. This is due not least to the constitutionally anchored public debt brake and the political objective of achieving a balanced budget by means of which government debt is to be held on a continuing downtrend. Accordingly, Finance Minister Schäuble announced the investment programme partly on the condition that strict spending discipline be maintained in other policy areas. This was probably aimed primarily at discussions about tax cuts (e.g. elimination of so-called "cold progression"). Only in this way can scope be found to boost investment.

One major (partial) reason for the failure to carry out the necessary maintenance investment in the past was politically motivated too: it is easier for elected representatives to adopt legislation pertaining to consumption expenditures – with their directly tangible benefits – and to postpone investment – for maintenance measures in particular – since the negative repercussions of their absence only kick in with a time lag. Funding the necessary investments – given tight public budgets – is thus also a question of setting political priorities and not only a matter of financial resources.

Limited stimuli for Germany and European neighbours

The calls on Germany – from abroad in particular – to boost investment are being raised not only with a view to Germany's growth potential. It is also hoped that this will result in positive growth effects for the rest of Europe.

It is correct that investments have a direct positive effect on growth, since they flow into GDP calculations. Moreover, if investment exceeds depreciation the macroeconomic capital stock increases, which boosts potential growth. In Germany, on the basis of the Solow growth accounting model, a 1% increase in the capital stock would ultimately increase growth by 0.2 of a percentage point. Of course, this correlation is based on historical developments. Not least because investments obey the law of diminishing marginal utility – i.e. each additional unit of capital contributes slightly less additional utility than the preceding one – and bring additional maintenance investment with them, it is not possible to simply extrapolate this historical correlation. Besides, the impact on potential growth is probably much lower now than historically.

Given the very extensive infrastructure in Germany (saturation effects), the growth effects of an increase in the public capital stock will probably be smaller than those for the overall economy.[8] In addition, this would also be set against economic costs, such as higher maintenance investment.

The debate about higher public investment in Germany primarily focuses on the issue of ending the decline in the public capital stock. In this respect, higher public investment would initially have a stabilising effect on the capital stock and thus on growth potential. For this reason we believe that the calculations of the IMF, for example, for growth effects in developed countries are too high in Germany's case. Furthermore, the multiplier effects exceeding a factor of one are likely to be overstated particularly in less developed countries on account of very promising investment opportunities in years past. It seems wrong in Germany's case to assume that substantially higher public investment can easily be self-financed – not least because of the country's demographic trend.

We are equally disinclined to share the view that Germany's European neighbours would noticeably benefit from higher German investment. Stronger German growth has minor effects on the peripheral countries of the eurozone in particular. Our calculations show that one additional percentage point of German GDP growth would improve the current accounts of the GIPS countries (Greece, Italy, Portugal and Spain) – by inducing higher German imports and travel expenditures – by 0.1% of GDP at best. The growth stimuli generated in the region would be correspondingly small. This is due to the fact that Germany itself is not unusually large in a European context and the related trade links are not sufficiently pronounced.

Higher private investment hinges on the right conditions

If the German government were to resolutely cover the public investment requirements on the order we suggest, this would be a necessary contribution to Germany's future viability as a place for doing business. Robust public (transport) infrastructure is not enough on its own to ensure the improvement of an economy's long-term growth potential. There are relatively large differences in the volumes of public and private investment and their importance for GDP. On this note, private investment is required in particular to enable Germany to maintain its standard of living for future generations.

Private investments are made on reasonable prospects of making a profit. In the current parliamentary term, however, Germany's grand coalition government has adopted legislation that clouds the picture and creates headwinds. Moreover, Germany has rested too long on its laurels after gaining ground in the 2000s. Managing the euro crisis played an inflated role and relegated domestic and economic policy issues to the sidelines. Over the next few years, it will be vital to avoid creating any further headwinds that hamper businesses. Indeed, politicians will have to ensure that tailwinds give the private sector a lift again.

[8] See also: Ragnitz, J. et al. (2013). Endbericht zum Forschungsvorhaben "Öffentliche Infrastrukturinvestitionen: Entwicklung, Bestimmungsfaktoren und Wachstumswirkungen". ifo Institute.

Further steps, in our view, should be taken to make the German labour market more flexible. At the same time, the government should desist from (further) intensifying the regulation of the market. The Energiewende ought to be implemented more efficiently and based more firmly on market structures, taking better account of the long planning horizons of private-sector investment. A skills-oriented immigration policy could help stabilise the inflow of migrants and thus slightly curb the impact of the demographic challenge.

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