More Growth through Higher Investment

by Stefan Bach, Guido Baldi, Kerstin Bernoth, Björn Bremer, Beatrice Farkas, Ferdinand Fichtner, Marcel Fratzscher, and Martin Gornig

While many countries in the euro area are deep in recession due to a debt and structural crisis, the German economy appears to have excelled compared to many other euro area countries. Unemployment has fallen to the lowest level since German reunification, economic output has grown by over eight percent since 2009, and public budgets have been consolidated, generating a surplus in 2012. But this is no cause for euphoria. On the contrary, if one looks at Germany's economic development from a more long-term perspective, we can see that the country is lagging behind in many areas compared to most EU member states and most euro area countries. Since 1999, the euro area countries have on average achieved more economic growth than Germany and this increase in competitiveness can be largely attributed to wage moderation rather than productivity growth. The rate of investment has been falling for a long time and is very low by international standards. The estimations in this study indicate that Germany has had an annual investment gap of three percent of GDP, on average, since 1999. This means that Germany needs to invest substantially more in order to reduce the investment backlog accumulated in recent years and also to ensure higher potential growth and prosperity in the long term.

At the same time, the savings rate in Germany is one of the highest by international standards. As evidenced by the enormous current account surpluses of seven percent in 2012, a considerable part of Germany's savings went abroad, however, rather than being invested in Germany. Overall, Germany has thus missed out on significant growth opportunities at home. Equally important, since 1999, German investors have lost around 400 billion euros on their foreign assets, which corresponds to approximately 15 percent of GDP. In the period from 2006 to 2012 alone, this figure was 600 billion euros, or 22 percent of GDP. At the same time, Germany shows an average investment gap of around 75 to 80 billion euros each year. Calculations by DIW Berlin in this study indicate that if the German investment gap had been closed, annual German economic growth per capita would have been in the last 15 years on average up to one percentage point higher. Germany also has a high degree of specialization in research-intensive industries and knowledge-intensive services. As a prime location with high requirements concerning human capital, conservation of resources, and mobility, the country has a particularly high demand for structural capital investment.

Simulations show that closing the investment gap of 3 percent of GDP in the medium term would lead to significantly higher economic growth in Germany. Potential growth would be 0.6 percentage points higher by 2017: at 1.6 percent of GDP as opposed to around one percent. The fiscal space to fill the public sector share of this investment gap already exists as fiscal consolidation has already been achieved, and the fiscal surplus is projected to rise to 1 percent of GDP by 2017. Thus the needed public investment spending can be financed with existing surpluses and would not require tax increases or expenditure reduction elsewhere. Also in light of more favorable financing conditions and fewer burdens on public finances in the coming years, the financial scope for public and private investment is currently extremely favorable and good use should be made of it now.

Average annual growth of the German economy has been at 2.6 percent since 2009 and the unemployment rate has dropped to the lowest level since reunification.[1] The export industry is competitive and managing to maintain high market shares in a difficult environment.[2] But we see a completely different picture over a longer period of time. Since 1999, the beginning of the European Economic and Monetary Union, the German economy has been lagging behind the euro area average in many respects. The average annual growth of GDP between 1999 and 2012 was only very moderate at 1.3 percent; up until the financial crisis, it was even 0.4 percentage points below average growth in the euro area (see Figure 1). Although the unemployment rate in Germany, which was very high at the beginning of the millennium, has been continuously falling, real wages stagnated at the same time, however (see Figure 2). It is only since the financial crisis that these have been developing more positively than in the euro area overall. The wage restraint prevalent in Germany up until recently was a disappointing development for many private households and led to low private consumer spending (see Figure 3).

Parallel to the weak development of consumer spending, saving levels in Germany are very high compared to other countries in the euro area. One might suppose that much of this money would then be invested in the country's future. But this is not the case: Germany's rate of investment is very low. At the same time, the country is in urgent need of investment. This shows that despite all the successes of the past few years, Germany has not created an investment basis to ensure robust growth.

Low Investment in Germany—A Study

Domestic investment is very low in Germany. This does not only apply to tangible investment normally reflected in the national accounts, including, for example, the purchase of new machinery by companies or construction of roads by the government. To safeguard the future modern economies, expenditure on product and production planning and on research and education is also growing in importance.[3] However, in the national accounts, this fact has been largely ignored to date.[4] This applies to intangible investment by the corporate sector as well as public spending. For instance, despite its investment character, expenditure on personnel training is recorded as public consumer spending and not as intangible public investment.

1 K. Brenke, "Sharp Drop in Youth Unemployment in Germany but Regional Differences Remain," DIW Economic Bulletin, no. 7 (2013).

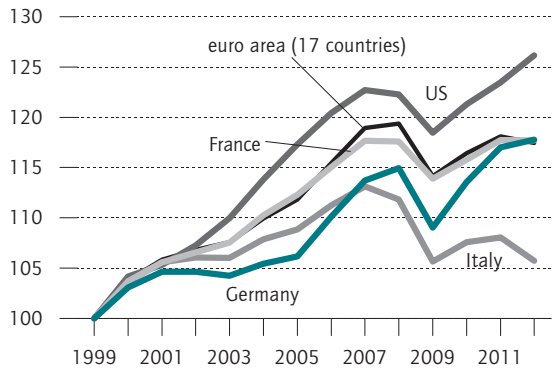
2 M. Gornig and A. Schiersch, "German Manufacturing Withstands the Rise of Emerging Economies," DIW Economic Bulletin, no. 5 (2012).

3 C. Corado, C. Hulten, and D. Sichel, "Intangible Capital and the U.S. Economic Growth," Review of Income and Wealth 55 (3) (2009): 661–685.

4 Only with the upcoming revision of the national accounts are there plans to include corporate expenditure on research and development under investment.

Figure 1

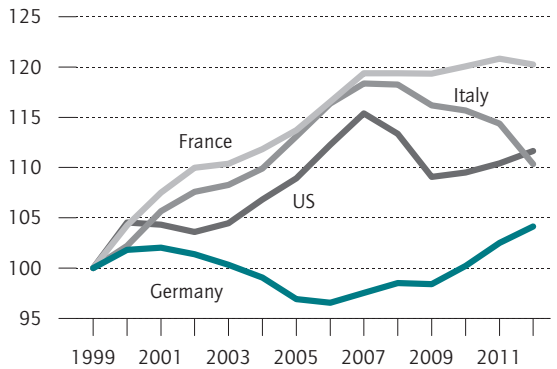
Real GDP
Index 1999 = 100



Source: European Commission.

Figure 2

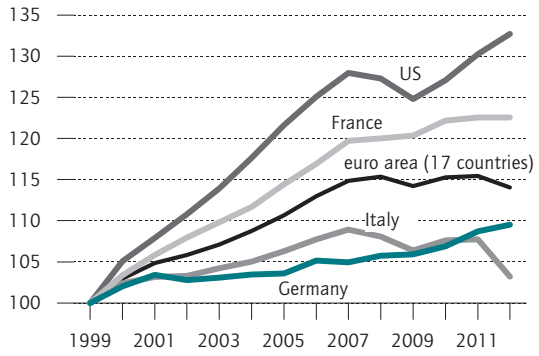
Real Wages
Index 1999 = 100



Source: European Commission.

Figure 3

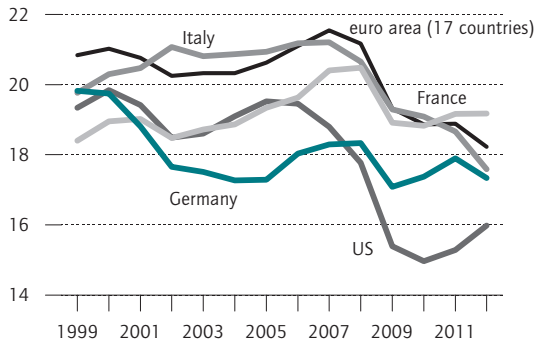
Real Private Consumer Spending
Index 1999 = 100



Source: European Commission.

Figure 4

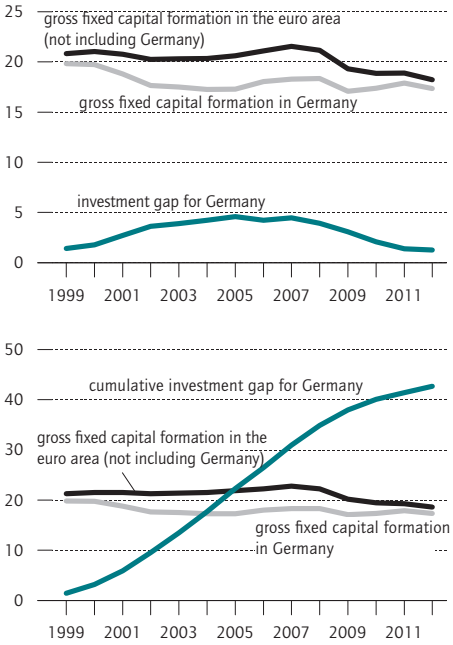
Gross Fixed Capital Formation
In percent of GDP



Source: European Commission.

Figure 5

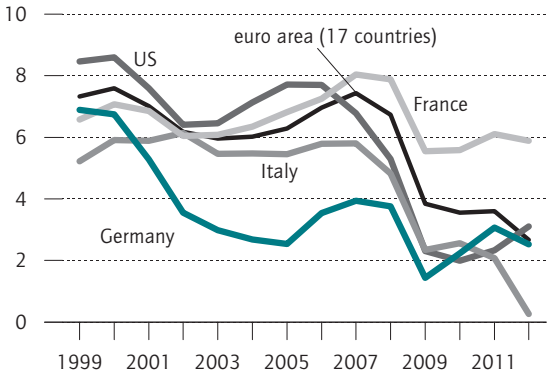
Germany's Investment Gap
In percent of GDP



The investment gap for Germany is calculated as the difference between investment in the euro area and in Germany (in relation to GDP).
Source: European Commission, calculations by DIW Berlin.

Figure 6

Net Fixed Capital Formation
In percent of GDP



Source: European Commission.

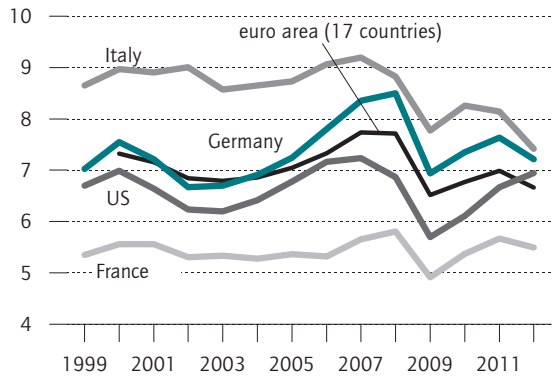
Using the available data, the present empirical analysis concentrates initially on presenting the tangible (physical) investment activity. In addition, on the basis of current research, intangible investment of companies will then also be examined by means of an international comparison. As a key area of intangible public investment, the education sector is analyzed in a separate article.[5]

The rate of investment—i.e., the ratio between gross fixed capital formation and GDP—in Germany was still at just under 20 percent in 1999. It is currently only just over 17 percent. Investment activity (in equipment and construction) in Germany is therefore significant-

5 See C. K. Spieß "Investitionen in Bildung: Frühkindlicher Bereich hat großes Potential," Wochenbericht des DIW Berlin, no. 26 (2013).

Figure 7

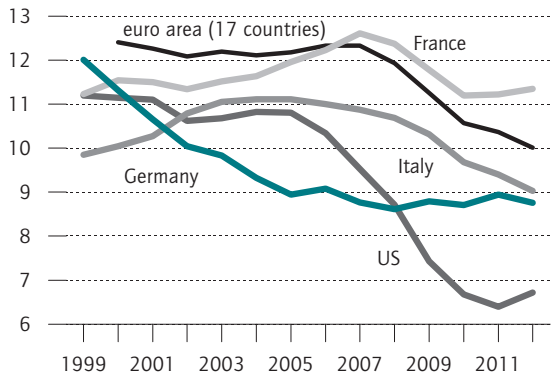
Investment in Equipment
In percent of GDP



Source: European Commission.

Figure 8

Investment in Construction
In percent of GDP



Source: European Commission.

ly lower than in many other countries (see Figure 4).[6] Only in the US is less invested than in Germany. Since 1999, compared to the rest of the euro area, Germany has recorded an annual investment gap of around three percent of its GDP on average. If this backlog is accumulated over the years, this would correspond to about 40 percent of current GDP—approximately one trillion euros (see Figure 5). As far as net investment is concerned—i.e., taking into account depreciation of existing capital stock—the low investment activity in Germany is even more evident (see Figure 6).

If individual investment components are taken into consideration, it can be seen that particularly in construction, investment in the first decade of this century was low by international standards; of the countries studied, only the United States demonstrated an even lower level of investment activity in this area recently (see Figures 7 and 8). One key factor causing Germany to lag behind in construction investment is the years of underfinancing of new residential construction and the below average development of privately financed infrastructure development.[7]

Private Intangible Investment

Countries with a large manufacturing industry such as Germany typically also have a high level of physical investment. When it comes to quality-based competition, it is increasingly important for companies to invest in their knowledge potential, however. This type of investment in research and development, marketing, further training, and management skills is defined as "intangible."

In this field, too, investment activity in Germany is weak overall, despite relatively high levels of research and development. Intangible investment as a share of GDP is at just under six percent (see Figures 9 and 10). In the US, however, almost nine percent of GDP is devoted to developing companies' knowledge capital. Among the countries studied here, only in Italy is intangible investment even lower than in Germany.

Public Tangible Investment

If we only look at public investment activity, we can see that in Germany since the end of the 1990s, particularly investment in the infrastructure and other construction work in relation to the GDP was gradually scaled back (see Table 1). The effect might be somewhat exaggerated due to what is defined as the government sector, since in the '90s economic activity at the municipal level was shifted to the corporate sector. The increased level in the '90s may also be largely due to German reunification. Overall, however, there has been a clear downward trend over the last ten years.

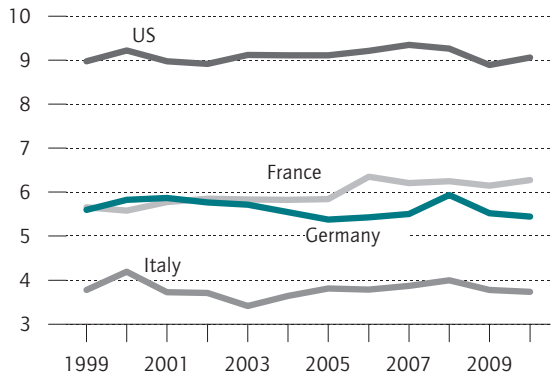
An international comparison shows not only that public investment in Germany has deteriorated over time, but also its level is considerably lower. The difference can be partly explained by changes in the scope and definition of the government sector, but even then, the differences in level are likely to remain significant. Apart from

6 See also J. Zeuner, "Zukunft braucht Investitionen," KfW Economic Research. Fokus Volkswirtschaft, no. 21, (May 3, 2013).

7 M. Gornig and H. Hagedorn, "Germany's Construction Industry: Strong Growth Followed by Stagnation," DIW Economic Bulletin, no. 1 (2012).

Figure 9

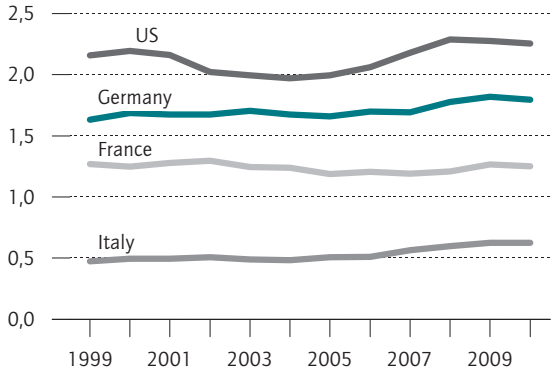
Intangible Investment*
In percent of GDP



** All intangible investment which is not included in the national accounts.*
Sources: INTAN-INVEST Database, Corrado. C., Haskel, J., Iommi, M., Jonc-Lasionio, C. (2012): Intangible Capital and Growth in Advanced Economies: Measurement and Compara-tive Results. CEPR Discussion Paper no. DP9061, calculations by DIW Berlin.

Figure 10

Investment in Research and Development*
In percent of GDP

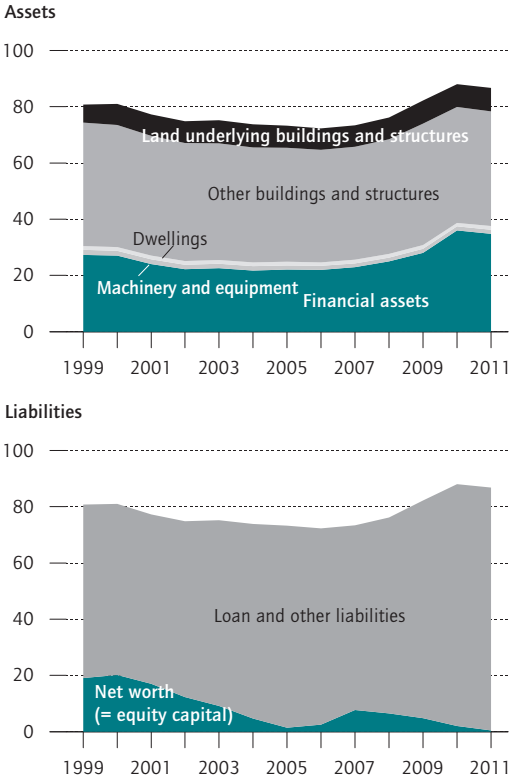


** Not included in the national accounts.*
Sources: INTAN-INVEST Database, Corrado. C., Haskel, J., Iommi, M., Jona-Lasionio, C. (2012): Intangible Capital and Growth in Advanced Economies: Measurement and Compara-tive Results. CEPR Discussion Paper no. DP9061, calculations by DIW Berlin.

in Germany, there has only been a decline in gross public investment in Austria, Belgium, and Switzerland. In most countries in the euro area, the EU, or in the US, public investment relative to the GDP has remained virtually constant over the years.

Figure 11

Macroeconomic Balance Sheet of the General Government in National Accounts
Year-end figure in percent of GDP of the relevant year



Sources: Federal Statistical Office, Bundesbank, calculations by DIW Berlin.

Public Wealth in Germany

Weak public investment activity has contributed to the considerable decline in Germany's public wealth (see Figure 11).[8] On the asset side of the general government's balance sheet, we see fixed assets, divided into land underlying buildings and structures, dwellings, other buildings and structures, as well as machinery and equipment and intangible fixed assets. Most of the public fixed assets fall under other buildings and structures, i.e, the public infrastructure in the form of transport rou-

8 Here, we use data from the marcoeconomic balance sheets, compiled by the Federal Statistical Office and the Bundesbank as part of the national accounts and financial accounts. The assets and debts are shown in relation to the GDP. Deutsche Bundesbank, Federal Statistical Office, Sectoral and macroeconomic balance sheets 1991-2011 (Deutsche Bundesbank, 2012). On the data sources and methods, see German Federal Bank, "Integrierte sektorale und gesamtwirtschaftliche Vermögensbilanzen für Deutschland," Monatsbericht (January 2008).

Table 1

Gross Capital Formation of the General Government in Selected OECD Countries
In percent of GDP

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Germany	2.0	1.9	1.9	1.8	1.6	1.5	1.4	1.5	1.5	1.6	1.7	1.7	1.6	1.5
Netherlands	3.0	3.1	3.3	3.5	3.6	3.2	3.3	3.3	3.3	3.5	3.8	3.6	3.4	3.4
Sweden	3.0	2.8	2.9	3.1	2.9	2.9	3.0	3.0	3.1	3.3	3.5	3.5	3.4	3.5
Austria	1.8	1.6	1.2	1.4	1.3	1.2	1.2	1.0	1.2	1.1	1.2	1.1	1.0	1.0
Finland	2.7	2.4	2.5	2.7	2.8	2.9	2.6	2.4	2.5	2.5	2.8	2.5	2.5	2.6
Switzerland	2.6	2.4	2.5	2.5	2.5	2.3	2.2	2.1	2.0	2.1	2.2	2.2	2.2	
Belgium	2.0	2.0	1.7	1.7	1.6	1.6	1.7	1.6	1.6	1.6	1.7	1.7	1.8	1.7
France	3.0	3.1	3.1	3.0	3.1	3.1	3.3	3.2	3.3	3.3	3.4	3.1	3.1	
Italy	2.4	2.3	2.4	1.7	2.5	2.4	2.4	2.3	2.3	2.2	2.5	2.1	2.0	1.9
Spain	3.4	3.2	3.3	3.5	3.6	3.4	3.6	3.7	4.0	4.0	4.5	4.0	2.9	1.7
Portugal	4.5	4.1	4.4	4.1	3.9	3.8	3.6	2.8	2.7	2.9	3.0	3.8	2.6	1.9
Greece	3.2	3.7	3.6	3.4	3.5	3.6	2.8	3.4	3.4	3.7	3.1	2.3	1.7	1.8
Ireland	3.1	3.5	4.3	4.2	3.6	3.5	3.5	3.8	4.7	5.5	3.8	3.5	2.6	2.1
UK	1.3	1.2	1.5	1.6	1.6	1.8	0.7	1.8	1.9	2.3	2.7	2.5	2.2	2.1
US	2.4	2.5	2.5	2.6	2.5	2.4	2.4	2.4	2.4	2.6	2.6	2.5	2.3	
Canada	2.3	2.3	2.5	2.5	2.5	2.5	2.7	2.8	3.0	3.3	3.7	4.1		
Japan							3.6	3.3	3.1	3.0	3.4	3.3	3.2	
Australia	3.0	3.0	3.0	2.8	2.8	2.9	3.0	3.0	3.3	3.6	4.2	3.9	3.5	
New Zealand	2.8	2.5	2.8	2.8	3.1	3.2	3.5	3.5	3.4	3.9	3.9	3.3		
Korea	5.4	5.4	5.5	5.2	5.7	5.8	5.4	5.0	4.9	5.0	6.2	5.1		
Euro area	2.6	2.5	2.6	2.5	2.6	2.5	2.5	2.5	2.6	2.6	2.8	2.6	2.3	
EU-27	2.4	2.3	2.4	2.4	2.5	2.4	2.3	2.5	2.6	2.7	2.9	2.7	2.5	

Source: OECD, National Accounts Database, May 2013.

tes, utilities and waste management systems, administrative and other buildings.

The financial assets and liabilities are from the financial accounts of the Bundesbank (German Federal Bank).[9] The government's financial assets are primarily deposits in the banking system, shares in companies, and loans to companies, private households, or foreign countries and organizations.

In 1999, net worth (= equity capital) of the general government sector was about 20 percent of GDP and, by 2011, it had declined to 0.5 percent of GDP and is, therefore no longer available for future generations.

High Savings Rate But Lack of Investment

Germany's persistently weak investment is even more striking considering the development and high national savings rate (see Figure 12). Between 1999 and 2003, saving at the macroeconomic level was almost consistently over 20 percent of GDP. Subsequently, savings formation increased dramatically, reaching a peak value of almost 27 percent in 2007. During the global financial crisis, a slight decline was recorded, but at approximately 24 percent in 2012, the figure was still considerably higher than in the 1990s.

However, rather than being used to develop the domestic capital stock, a significant share of German savings is invested abroad. Banks invested part of their savings deposits in the US subprime or Spanish property markets; private investors used their money to buy securities worldwide or transferred it to foreign bank accounts. Over the years, the current account surplus has continued to grow (see Figure 13). However, overall, investments abroad did not pay off. Foreign investment—defined here as cumulative current account balances—resulted in an increase in net foreign assets only initially (see Figure 14). However, since the financial and economic crisis, German investors have had to accept significant valuation losses. While domestic investment generally maintained its value, investment in foreign real estate markets or securities, for instance, saw its value plummet. Since 1999, German investors have lost approximately 400 billion euros on their foreign assets, which corresponds to around 15 percent of the country's GDP. In the period between 2006 and 2012 alone, the figu-

9 Deutsche Bundesbank, Financial accounts for Germany 2006 to 2011, Special Statistical Publication (June 24, 2012).

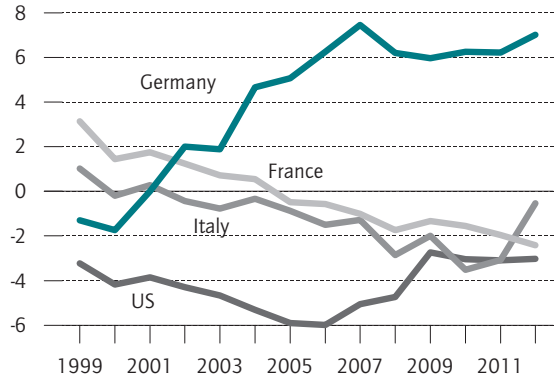
Figure 12

National Savings
In percent of GDP

Source: IMF.

Figure 13

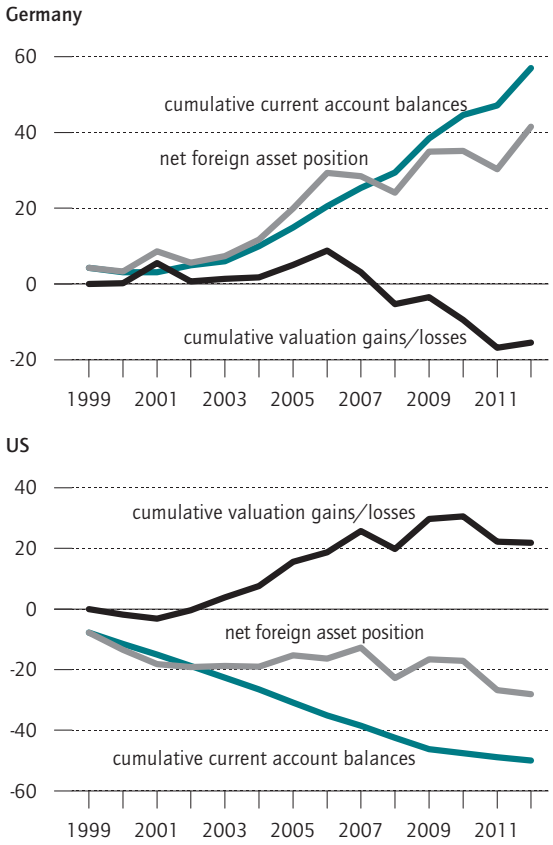
Current Account Balance
In percent of GDP



Source: IMF.

Figure 14

Net Foreign Assets
In percent of GDP



Source: IMF, calculations by DIW Berlin.

re was even as high as 600 billion euros, or 22 percent of GDP.[10] Despite high annual current account surpluses, in fact, in 2011, Germany's net foreign assets slid back to the 2005 level. Although other euro area countries also had to accept a decline in the value of their foreign assets during the economic crisis, these were, for the most part, minimal. Some countries, such as the US in particular, were even able to secure valuation gains in the long term. Despite high cumulative current account deficits, the US has only experienced a slight drop in the value of its net foreign assets since 1999.

A comparison of the average macroeconomic profitability of investment in the individual OECD countries between 2000 and 2010 makes it even more surprising that German savings were invested abroad on such a large scale. The ICOR,[11] which measures the average rate of investment in relation to GDP growth, indicates that with investments made, by international standards, Germany achieved high economic growth (see Figure 15). Only in the UK, the US, and Sweden was the investment efficiency higher than in Germany.

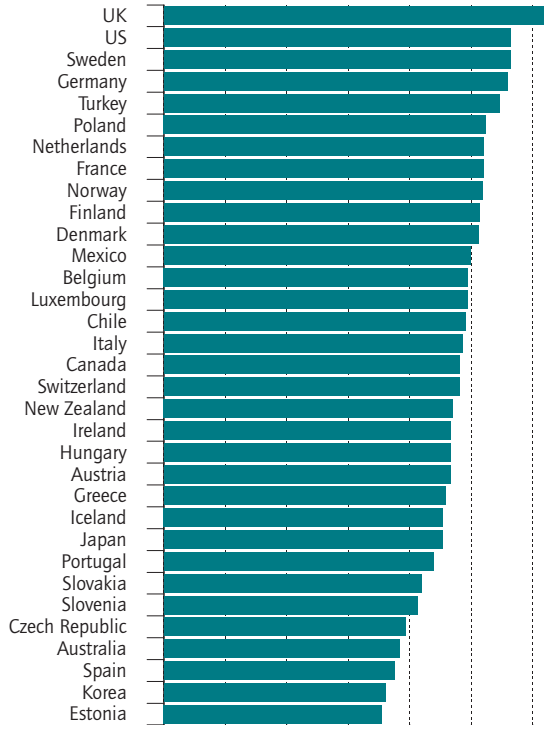
A significant impetus for German investment abroad was probably the expectation of high returns. However,

10 See also E. Klär, F. Lindner, and K. Sehonic, "Investitionen in die Zukunft? Zur Entwicklung des deutschen Auslandsvermögens," Wirtschaftsdienst 3 (2013): 189–197.

11 ICOR stands for Incremental Capital-Output Ratio and is used to denote investment efficiency.

Figure 15

Efficiency of Investments Based on Inverse ICOR*
Average from 2001 to 2010



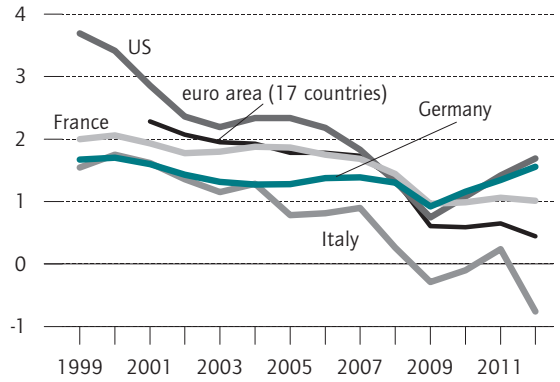
ICOR = average investment rate / GDP growth.
Source: OECD, calculations by DIW Berlin.

with hindsight, in recent years, this expectation was not fulfilled. The losses on investments abroad have made domestic investment more attractive, resulting in more funds flowing into certain sectors in Germany, such as construction.

Alongside private investment, public investment also plays a major role in Germany's future economic development. On the one hand, public investment has to increase in order to bridge the substantial investment gap that has developed in recent years. On the other hand, this type of investment is necessary to secure Germany's position as an attractive business and investment location in the long term.

Figure 16

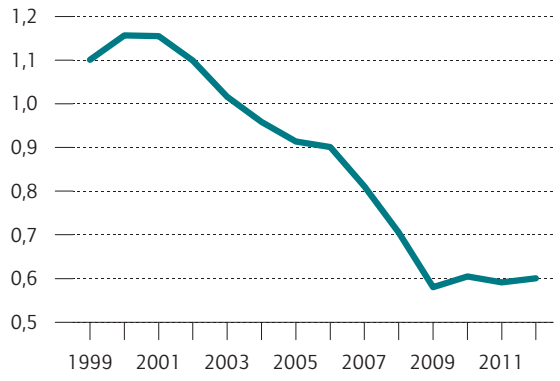
Growth in Potential Production
In percent



Potential production denotes the macroeconomic production that would be achievable if economic production factors were fully exploited.
Source: European Commission.

Figure 17

Growth in Total Factor Productivity
1995–2008, in percent



Total factor productivity denotes the share of economic growth not caused by labor and capital input but rather technological progress and use of resources.
Source: European Commission.

Investment Pivotal for Productivity and Growth

In the last decade, the potential growth of the German economy was very low and certainly weaker than in other developed countries (see Figure 16). For the development of potential economic growth, total factor

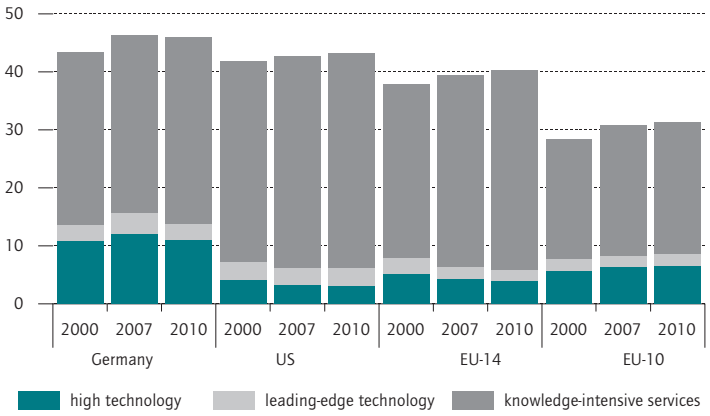
productivity (TFP) plays a decisive role, i.e., the share of economic growth that cannot be attributed to the traditionally measured factors, labor and capital input, but rather technological progress and resource management. Growth of TFP in Germany has also been declining since 1999 (see Figure 17).

Germany has a high degree of specialization in knowledge-intensive sectors (see Figure 18). It has also maintained a competitive edge on the global market, particularly with its research-intensive industries in the high-tech sector (chemical industry, mechanical engineering, electrical engineering, and automobile production).[12] However, knowledge-intensive services are also gaining ground. To secure and expand the knowledge-intensive industries, significant investment is required—both private and public, frequently both tangible and intangible.[13] Therefore, investing in the promotion of research and development as well as in education can make a significant contribution to boosting total factor productivity.

Figure 18

Sectoral Specialization

Sectoral share of gross value added, in percent



Sources: WIOD (2012); OECD STAN (2012); Eurostat (2012); UNSD (2012), calculations and estimates by DIW Berlin.

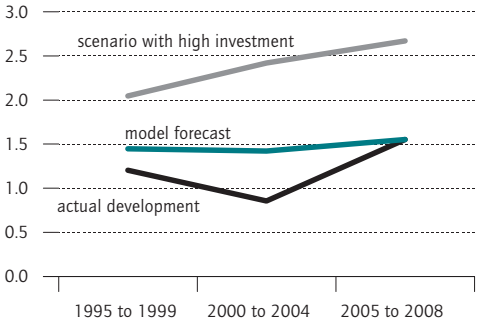
Several scientific studies show that TFP—and thus also potential growth—is, to a significant extent, defined by a country's investment activity along with the level of education and investment in research and development.[14] It can, therefore, be assumed that the slow productivity development and moderate economic growth observed in Germany in recent decades can also be attributed to weak domestic investment activity.

A regression analysis conducted by DIW Berlin confirms a positive correlation between per capita economic growth and investment activity in general and investment in education and research and development in particular (see box). Based on estimates, this study calculates the effect of two different scenarios on Germany's per capita economic growth: a) A three-percent increase in Germany's rate of investment, more or less corresponding to the average investment gap since 1999 as compared with the euro area as a whole could result in per capita GDP growth of around 0.85 percentage points higher. b) A rate of investment equivalent to the longstanding OECD average, which corresponds to around 22 percent, could see Germany's per capita economic growth increase by as much as one percentage point. The historical path of per capita economic growth with a higher rate of investment is simulated to substantiate this finding (see Figure 19).

Figure 19

Simulation of Germany's Per Capita Growth

In percent



Sources: European Commission; Penn World Tables; World Bank, calculations by DIW Berlin.

A continuous increase in investment activity is shown to trigger an increase not only in per capita economic growth but also in potential growth.[15] Assuming TFP

12 Gornig and Schiersch, "German Manufacturing wthstands the Rise of Emerging Economies", DIW Economic Bulletin 5, 2012: 10-14.

13 "Bedeutung der Wissenswirtschaft im Euroraum und in anderen Industrienationen," Studien für die Expertenkommission Forschung und Innovation 7 (2013).

14 See, for example, R. Barro, X. Sala-i-Martin, Economic Growth, 2nd ed. (MIT Press Books, 2003); D. Coe, E. Helpman, and A. Hoffmaister, "International R&D Spillovers and Institutions," European Economic Review 53 (7) (2009): 723–741.

15 The European Commission's method framework is particularly suitable for simulating potential growth in the medium term. For a detailed description of this method, see F. D'Auria, C. Denis, K. Havik, K. McMorrow, C. Planas, R. Raciborski, W. Röger, and A. Rossi, "The Production Function Methodology for

Box

Regression Analysis

Table 1

Dependent Variables: Per Capita GDP Growth

	(1)	(2)
Per capita GDP in 1995 (in log)	–12.76***	–10.48***
Investment (in log)	3.01	4.78**
Education (average years of schooling)	0.66***	
Direct investment	0.03**	0.02**
R&D	1.15*	1.24
Expenditure per elementary school student		–0.1
Constants	115.88***	95.06***
Number of observations	55	51
R^2	0.74	0.71

, **, * denotes significance at the 10, 5, and 1-percent level.*

Table 2

Dependent Variables: Growth in Total Factor Productivity (TFP)

	(1)	(2)
TFP (–1)	0.21**	0.22***
Per capita GDP in 1995 (in log)	–8.65***	–8.43***
Investment (in log)	–2.78**	–4.14***
Education (public expenditure)	0.22**	
R&D	0.41	0.39
Direct investment	-0.02	0.007
Openness of the economy (in log)	4.02***	3.19***
Expenditure per elementary school student		0.04*
Constants	80.03***	85.84***
Number of observations	53	51
R^2	0.84	0.82

, **, * denotes significance at the 10, 5, and 1-percent level.*

In order to examine the impact of investment in the infrastructure and in education and research on long-term per capita GDP growth, a regression analysis was conducted using panel data for 19 OECD countries for the period from 1995 to 2008 (see Table 1). The findings indicate that investment and the level of education, measured as total years of schooling,[1] have a significant impact on economic performance per capita, even in the medium term. The estimated values remain robust, also when the remaining control variables are factored in.[2]

The estimated findings show that a ten-percent increase in the rate of investment boosts per capita economic growth by almost 0.5 percentage points. This means that an increase in the German rate of investment of four percentage points, from its current level of just over 17 percent to the longstanding OECD average, could result in economic growth of almost one percentage point. An increase in the level of education would trigger a further surge in growth, and research and development expenditure also has a positive impact on economic growth.

1 This corresponds to the proxy variable that is usually used for the level of education of the country.

2 See Barro and Sala-i-Martin, Economic Growth, The MIT Press, 2nd edition, 2003.

growth continues to rise from 2013, compared to levels reached between 2000 and 2008 by the highly productive group of European countries (Sweden, Finland, and Austria), and also assuming the rate of investment continually increases from 22 percent—the longstanding average OECD rate—by 2017, Germany's potential growth could be at 1.6 percent and thus around 0.6 percentage points higher than would be the case if investment, education, and research expenditure remain unchanged (see Figure 20).

The growth-promoting effect of stronger investment activity in Germany would create the basis for a sustainable increase in real disposable income. A regression analysis with income growth as a dependent variable

Calculating Potential Growth Rates and Output Gaps," Economic Papers 420 (2010).

Table 3

Dependent Variables: Annual Growth of Real Disposable Income
In percent

	(1)
Investment (in log)	1.76*
Primary education	0.04
R&D	1.1**
Direct investment	0.01**
Constants	-7.3***
Number of observations	44
R^2	0,64

, **, * denotes significance at the 10, 5, and 1-percent level.*

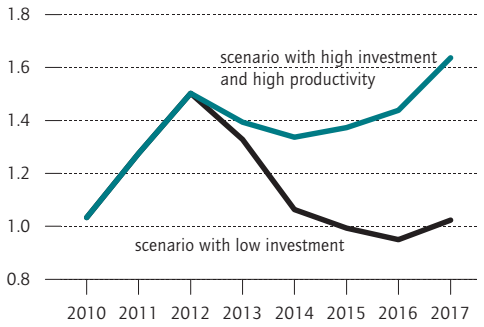
Furthermore, it is evident from the regression analyses that the positive effect of investment in education and research primarily influences total factor productivity. This emphasizes the crucial importance of this type of investment for future economic growth, particularly for the knowledge-intensive industries (see Table 2).

To examine how investment in the infrastructure and in education and research impacts income growth, the regression analyses were repeated using the annual growth of real disposable income as an independent variable (see Table 3). Both investment in general and investment in research and development in particular promote income growth. A four percentage point increase in the current rate of investment of 17 percent would lead to an increase in the growth of annual disposable real income of 0.4 percentage points.

shows that the three determining factors, total investment, the degree of education, and the level of expenditures in research and development can lead to excessively higher incomein the medium term. If Germany's rate of investment were to increase to the level of the longstanding OECD average, this would result in a 0.4 percentage point increase in the annual growth of real disposable income.

Figure 20

Potential Growth with Increased Investment and Total Factor Productivity
In percent



Source: European Commission, calculations by DIW Berlin.

Table 2

Selected Fiscal Figures
In relation to nominal GDP

	2012	2013	2014	2015	2016	2017
Nominal fiscal balance*	0.2	0.1	0.4	¾	¾	1
Structural fiscal balance*	0.4	0.6	0.7	¾	¾	1

** Based on the national accounts as of February 2013.*
Source: Federal Statistical Office, calculations by DIW Berlin.

Sufficient Financial Leeway Exists

The financing conditions for public and private investment are currently extremely favorable. This situation is also unlikely to change dramatically in the coming years. Germany is continuing to profit from the sustained uncertainty on the European financial markets; in search of comparatively secure investment opportunities, investors have increasingly focused on Germany. Furthermore, the real economic situation is also good, but, more importantly, the structure of economic growth with regard to public budgets is very favorable. Thus, economic growth is currently supported by the domestic market, and the labor market is developing positively. A study by DIW Berlin shows that, over the medium term, government budgets are expected to enjoy increasing surpluses. For the year 2017 alone, a surplus of just under 28 billion euros is anticipated, which corresponds to approximately one percent of German GDP

(see Table 2).[16] These surpluses are expected to be mainly of a structural nature, i.e, not driven by economic developments. During the same period, the debt ratio is expected to decrease substantially, particularly because some of the contingent liabilities resulting from the financial crisis are likely to be dissolved. German financial policy should make use of this excellent fiscal situation and create a road map today for higher potential growth in the future. Investment in research and education should be prioritized.

Conclusion

It is a matter of some urgency that Germany deals with this lack of investment and closes the investment gap as soon as possible. It is essential for Germany to pave the way for this now since it takes time for such investment to bear fruit. Increased public and private investment today would not only fuel Germany's economic growth but also provide a significant impetus for growth in Europe as a whole. At present, this would be the most effective way for Germany to help its neighbors.

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16 See K. van Deuverden, "Mittelfristige Wirtschaftsentwicklung: Stabiles Wachstum und hohe Überschüsse der öffentlichen Haushalte," Wochenbericht des DIW Berlin, no. 16 (2013).

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