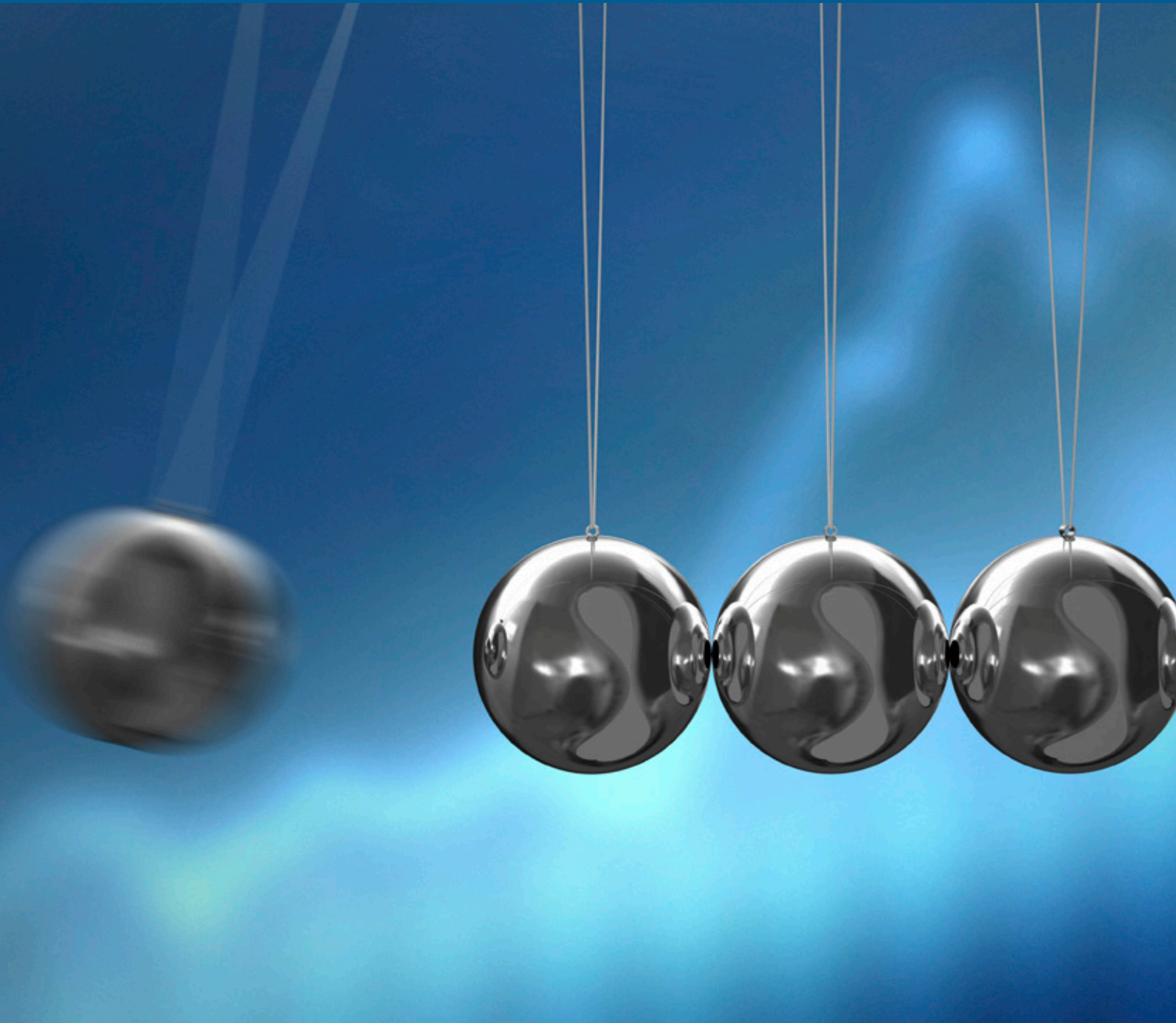


INCREASING INVESTMENT IN GERMANY



*REPORT PREPARED BY THE EXPERT COMMISSION ON BEHALF OF THE
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Expert Commission's Report on
Increasing Investment in Germany

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Foreword

The independent Expert Commission was appointed by Federal Minister for Economic Affairs and Energy Sigmar Gabriel in August 2014 to draw up recommendations for action to increase private and public investment in Germany. The 21 members of the Expert Commission represent broad sections of German industry, society and academia. The Commission has the task of examining German society and industry from an overall perspective. An efficient, forward-looking public infrastructure and conditions that make Germany highly attractive to domestic and foreign investment as a location for business and industry are fundamental prerequisites for safeguarding prosperity in Germany on a long-term basis.

The Expert Commission's final report focuses on the question of how incentives for more private investment that will ensure growth and jobs in Germany over the long term can be created through public investment activity and the establishment of a better investment environment. It is our aim not only to map out from a critical standpoint the strengths and weaknesses of the current conditions for investment in Germany but also, and particularly, to provide policy makers in Germany recommendations for concrete action.

The Expert Commission's key strengths are the broad expertise and range of perspectives its members offer. The recommendations in this report express the consensus of the Commission members. This does not mean that each member subscribes to every sentence in this report, but rather that all members of the Expert Commission support the vast majority of the findings and recommendations for action that are outlined in it. In some cases where the Commission members were not agreed or they identified a need for further study, the report points out different options which can be used to improve the status quo.

Despite this strong consensus, different opinions do exist within the Commission regarding the fundamental causes of weak investment in Germany:

Some Commission members are of the opinion that the weak investment performance observed in Germany is largely a reflection of the consolidation pressure and tax cuts of the last ten years that have reduced the leeway for public spending. These members maintain that this has led, on the one hand, to the public infrastructure being neglected and, on the other hand, to a weakening of aggregate demand, with negative consequences for private investment. These members favour increasing public investments on a tax-financed basis, along with using the

leeway available under the "debt brake". Even though this is not recommended in the Commission's report, some members deem it important to avoid a misinterpretation here and to stress that a shift in budgetary responsibility from the Federal Government to Germany's state and local governments should not take place. The supplementary and deviating opinions of the five union members are presented in a separate section following the summary.

Other Commission members see the key to improving Germany's infrastructure in increased and more efficient public investment. These members reject tax increases and new borrowing for financing increased investment spending. Instead, some of them advocate restructuring expenditure, reducing the taxation of property and systematically mobilising additional private capital in order to increase the scope available for investment.

Some of these members emphasise that the enormous backlog of investments to maintain and expand public infrastructure clearly shows that the government cannot meet this challenge on its own. This group contends that solutions to this problem must therefore go beyond just reorganising government activity. Public-private partnerships (PPPs) could make an important contribution to closing the investment gap, they say. Other countries have shown that it is possible to use PPPs to deploy private savings in targeted and efficient ways to finance public infrastructure, this group notes. The political sector must aim to inject more objectivity into the debate on PPPs – which is conducted largely on an emotional level in Germany – and to invite tenders for considerably more infrastructure projects on a basis that allows PPP participation. Otherwise, these members state, there is the risk that existing financial resources will be invested exclusively or in very large part outside of Germany.

At the same time however, all the members of the Expert Commission agree that making the following report an arena for an economic policy debate would contradict the Expert Commission's mandate. The analysis and recommendations for action contained in this report therefore concentrate on the question of how investment in Germany can be increased without having to resort to changes in the fiscal, tax, energy or European frameworks that would be controversial or difficult to implement at political level.

The submission of the report on 21 April 2015 should not be the end of the Expert Commission's work. The Commission's members are very interested in providing flanking support for its recommendations and the actions taken

in the economic policy field in Germany. The Expert Commission has therefore set itself the goal of evaluating the implementation of the recommendations made in this report and other measures to increase investment in Germany and publishing the results of this evaluation yet in this legislative period.

This report is the result of very intensive work that the Commission has conducted since August 2014. It was drafted in the course of six meetings and numerous teleconferences. Not only the 21 members of the Commission but also many others made important contributions. This latter group includes first and foremost the alternates of the Commission members who were not always able to attend the meetings, plus a number of external experts. Special thanks go to Prof. Dr Thorsten Posselt (Fraunhofer MOEZ), Prof. Torsten B. Böger (VIFG, Verkehrsinfrastruktur-

finanzierungsgesellschaft mbH) and Franz Nauschnigg (OENB) for their contributions, and also to the representatives from several institutions such as the Federal Ministry of Finance and the Federal Ministry of Transport and Digital Infrastructure.

The Federal Ministry for Economic Affairs and Energy was not only responsible for the logistical coordination and organisation of the meetings, it also worked intensively together with the Commission on preparing the report. Sincere thanks go to Dr Jeromin Zettelmeyer, Dr Martin Meurers, Dr Raphael L'Hoest and Dr Bastian Alm. Special thanks go to the team from DIW Berlin (German Institute for Economic Research) – Prof. Dr Martin Gornig, Dr Claus Michelsen, Dr Beatrice Pagel, Dr Alexander Schiersch, Eva Tamim and Sabine Fiedler – for their outstanding work and support.

Summary

1. Weak investment in Germany: Background

Investment is the foundation for economic growth and employment. A modern capital stock is the basis for technological progress, ensures a country's competitive strength, forms the basis for business success and the sustained development of highly skilled employment, and makes an intact and valuable community possible. The investments needed for tomorrow must be undertaken today so that Germany as a location for business and industry can continue to offer prosperity and jobs for coming generations as well.

Germany's investment performance in both the public and the private sector is currently quite weak. In the Coalition Agreement, the Federal Government set itself the goal of closing the gap between Germany's investment level and the OECD average. This gap was three percentage points of GDP in 2013. The Commission considers it urgently necessary to increase investment in the coming years. The government has the task of ensuring through public investment the preservation and development of not only the technical but also the social infrastructure in Germany, meeting societal needs and establishing adequate conditions for private investment and economic growth. The demographic trend will also present Germany with enormous challenges in the coming decades. The declining number of gainfully active persons will not only require an adjustment in the capital stock, it will also necessitate specific, extensive investment in order to deal with the changing realities of Germany's ageing society.

A central weakness in Germany is the insufficient maintenance of public infrastructure over the past years and decades. Cities and municipalities with few economic resources have particularly reduced their investment budgets substantially in recent years. As a result, a growing need for investment in areas such as transport, education, and social infrastructure is emerging at the local level. One of the key reasons for this is the fact that many municipalities are inadequately funded. Consequently, remedying weak investment in the public sector will require new impetus to help municipalities develop new means for action.

Private investment activity in Germany has also been sluggish in the past years. Net private investment in fixed assets declined sharply between 1990 and 2005 and has since remained at a low level of approximately two per cent of Germany's Gross Domestic Product (GDP). Compared to other major economies, Germany's capital stock is not very modern and must be upgraded.

Overcoming this investment gap will require a broad approach. This report concentrates first of all on analysis and recommendations for action in the area of public infrastructure investments, particularly at municipal level, and in the area of federal trunk roads. Moreover, it is the task of the state to establish adequate conditions for private investment. The objectives in this connection must be to ensure that the markets function and to improve the way they function. The Expert Commission stresses that public investment and private investment are highly complementary. Employment, economic growth and prosperity depend on a dynamic, innovative economy which in turn requires an efficient public infrastructure and a corresponding environment.

These conditions include strong and stable domestic demand, adequate regulation and incentive structures for domestic and foreign companies in Germany. More specifically, this would involve, for example, improvements in the general regulatory framework in the energy sector or in the area of digital networks. A more efficient tax system that is compatible with incentives is also important for increasing the amount of private investment in Germany. What counts here is not only markedly greater investment in tangible fixed assets but most importantly in "minds" and in an intact and productive community. Innovative capacity is of vital importance in order for Germany to be able to assert itself as a location for business and investment and its global leadership in many areas in the coming years and decades.

Weak investment is not a purely German phenomenon by far. The current level of public and private investment is too low in many other countries in Europe as well. In light of this, strategies for boosting investment in Germany should be integrated into a pan-European investment initiative such as the "Juncker plan".

2. Mechanisms for ensuring sustainable public investment

In past decades many regional and local government bodies have seen their debt ratios rise and experienced a marked shift from public investment to higher public consumption expenditure. The introduction of a limit on public borrowing (“debt brake”) in 2009 and the fiscal target of balancing the Federal budget while not taking on any new debt (“black zero”) aim to stem the trend toward growing public debt and in turn counter the shifting of these burdens to future generations. Since government transfer payments are often given higher priority but are not available – at least in the short term, the resultant pressure to consolidate has a disproportionate impact on public investment. This will place a heavy burden on future generations because of, for example, the failure to undertake the necessary maintenance investments. In light of this, the Expert Commission recommends more voluntary binding commitments on the part of public authorities to ensure sustained investment. This can be accomplished with the following measures:

- Examination of the establishment of a **budgetary commitment to undertake public investments** in an amount that would at least offset the depreciation of public property. A budgetary rule of this kind would require the recording of property and depreciations which would in turn necessitate the introduction of double-entry bookkeeping. The majority of Germany’s municipalities have already established the use of double-entry bookkeeping. Germany’s Federal Government and many of its state governments have not yet introduced double-entry bookkeeping but should do so without delay.
- A **budgetary stipulation at Federal level that unexpected budget surpluses** are, as a priority, to be used for increased public investment. This would restore the symmetrical treatment of public investments: Since unexpectedly low receipts under the constitutional limit on government debt (“debt brake”) often lead to a decline in investment, an unexpectedly good budget situation should first and foremost benefit investment.
- The **creation of specialised institutions** that can support regional and local authorities in connection with new investment and maintenance in specific categories of infrastructure. These institutions should have reliable, long-term funding that cannot be reversed on a short-

term basis or can be reversed only with difficulty. An example of this would be a public infrastructure company for federal trunk roads (as proposed in section 3B).

3. Provision of public infrastructure

A. Ways to strengthen local infrastructure

From an economic policy standpoint, increasing the amount of investment in Germany’s cities, municipalities and districts is of key importance. However, local governments in Germany have developed enormous investment backlogs in recent years. In numbers, the net fixed assets of the municipalities in Germany declined by EUR 46 billion between 2003 and 2013. Estimates from the KfW Municipal Panel indicate that the municipal investment backlog currently totals EUR 118 billion.

It is therefore crucially important that the amount of municipal investment be increased. When making investment decisions, consideration should be given to societal requirements and economic viability/efficiency as set out in the state constitutions and stated by the Federal Ministry of Finance. At the same time, investments are to be financed cost-effectively, carried out efficiently and in high quality, and possible risks are to be taken into account and minimised: An appropriate balance must be struck between financing, efficiency and risk. The Expert Commission underscores that in the presently good economic climate the German government has sufficient financial leeway to reduce the investment gap in the public sector at Federal, state and municipal level. This also applies to financially strapped municipalities when they receive sufficient assistance from the Federal Government and their respective state government. In fact, the challenge here lies in the high degree of heterogeneity among German municipalities: Many municipalities have sufficient financial leeway, others do not. Financially strapped municipalities want to make efforts and take charge of public investment. However they need assistance – in the form of increased equity for investments and logistical support – in order to put their limited resources to efficient use.

To increase municipalities' financial scope, the Expert Commission proposes the following measures:

- Creation of a **National Investment Pact for Municipalities** to enable an increase in municipal investment by at least the amount of the computed municipal asset erosion of the last three years (EUR 15 billion) over the next three years. In addition to the EUR 3.5 billion special fund recently announced by the Federal Government for certain investment purposes, the National Investment Pact for Municipalities should include a second instrument that is open-ended and can be used on a more flexible basis - for example, for maintaining or expanding local transport infrastructure. Municipalities meriting assistance could be identified with the help of the successful Joint Federal/State Scheme for the Improvement of Regional Economic Structures. In order to include fast-growing municipalities as well, the areas that are fundamentally eligible for assistance should at the same time be expanded so that they cover a larger segment of the German population. The municipalities' share should be noticeable but small (10 to 30 per cent).
- Strengthening the municipalities' capacities so that projects can be planned and implemented as economically and efficiently as possible. When municipalities are no longer able to plan and implement projects in this way, sufficient capacity should be (re-)established. In addition, the creation of an **"infrastructure company for municipalities"** or, alternatively, several different regional and infrastructure companies for specific types of infrastructure should be examined. Such companies would be funded by the Federal and Länder governments. An infrastructure company of this type would have the task of helping municipalities choose the best and most economical variant for their particular needs from the different project and procurement variants available and of strengthening the planning and implementation process. In this connection, the respective municipalities should retain their decision-making authority. All municipalities, regardless of their financial capability, size or capacities, should have access to this municipal infrastructure company.
- Examination and, if appropriate, the progressive development of **"public collaborations"** – procurement models where public undertakings and collaboration between municipalities take centre stage. Such models could be a useful alternative or complement to existing procurement methods which offer certain advantages

over conventional approaches or public-private partnerships. The economic feasibility of this variant should of course also be examined before a municipal government decides to use it. Existing public collaborations should also be evaluated in order to determine whether they could be useful as a supplement to conventional procurement methods.

The Expert Commission stresses that these elements – the municipal investment pact, the municipal infrastructure companies and the progressive development of project and procurement variants – can act and function independently of one another. The aim of these elements is to put municipalities in a position to be able to undertake necessary investments and to do this efficiently and sustainably and nonetheless in a way that is less costly for the taxpayer and for the individual municipality.

B. Transport infrastructure at Federal level

Roads as a mode of transport are and will remain of paramount importance for freight traffic and passenger transport. Which is why maintaining and expanding national roads in particular is of vital importance to ensuring the German transport system's capacity and proper functioning. A particular challenge in this connection is the pent-up need that has developed in recent years for investments necessary to maintain existing infrastructure. As a long-term solution for ensuring investment in federal trunk roads, the Commission proposes examining the possibility of establishing a public **infrastructure company for federal trunk roads** (transport infrastructure company) that would offer the following:

- Construction, maintenance and management of federal roads "from a single source" following the life cycle approach.
- Financing primarily or exclusively from usage charges without leading to any additional burdens for car users.
- Capacity to borrow without government guarantees so that a clear demarcation to the public sector is ensured.
- Preservation of public oversight. This particularly means no "privatisation" of Germany's federal trunk roads in any form whatsoever.

The structure of a company of this kind should be the subject of a thorough examination by the Federal Government.

Of fundamental importance is the decision regarding the ownership of the infrastructure company, which provides the basis for determining the company's tasks and responsibilities in the context of the general conditions. The Expert Commission is in agreement that the public sector should hold at least a majority stake in this infrastructure company; some members even recommend that the infrastructure company should be wholly state-owned. The Expert Commission recommends that the experience other countries – such as Austria, France and Switzerland – have gathered in connection with different organisational structures be drawn upon when working out the concrete terms and details of such a company.

C. Mobilisation of additional private infrastructure financing

At present, the vast majority of infrastructure projects in Germany are realised using “conventional” methods so that the planning, construction and operation of projects is in part awarded or rendered by public contracting authorities and are paid using own resources, bank credits or fixed-rate bonds. However, with this procurement model, the public sector bears nearly all the risks. This can pose enormous financial difficulties for smaller municipalities in particular and limit their ability to act. Alternatively, projects are realised through public-private partnerships, where private investors are to provide financing and subsequently be liable for mistakes during construction or operation and for other risks. The contracting authority in the public sector must however pay for this risk transfer through higher financing costs. Furthermore, the transfer of risk does not succeed in all cases.

The Expert Commission proposes examining further procurement and financing structures. More specifically, it recommends examining the following two models.

→ A **public infrastructure fund** administered by Germany's Federal Government and state governments. The tasks of this fund would be similar to those of a private infrastructure fund. Private institutional investors would have the opportunity to invest in this fund at their own risk. This would at the same time ensure that only projects would be financed that offer advantages over conventional procurement methods and where risk is appropriately shared. In addition, by bundling several projects, risk would be spread and the efficiency gains arising from this would be split between the public contracting authority and the investors. The business

models of existing development banks could possibly be expanded in this direction.

→ A “**citizens' fund**” as a collection point for infrastructure financing provided by individual savers, set up to promote citizen participation. This type of fund would offer people a new type of investment that would enable better returns – with an acceptable level of risk – than other investments such as savings deposits, demand deposits or government bonds and could additionally make a contribution to society.

Investments on the part of individuals should be promoted pursuant to the Capital Accumulation Act (bonus on employee saving schemes). To increase people's identification with the investments they are financing, special transparency and information requirements for the different forms of investment in infrastructure should be laid down in the Investor Protection Act and elsewhere that will ensure that individuals can, for example, obtain information about a project's progress or key figures on the use of the infrastructure.

4. Framework conditions for private investment

A. Horizontal measures

A key reason for the German economy's competitive strength is its unusual mix of large corporations, a large number of micro-businesses and self-employed persons, and a broad segment consisting of small and medium-sized enterprises. However the amounts that German enterprises are investing in Germany have declined noticeably over the past decades. They are too low to preserve a modern capital stock or ensure Germany's long-term competitiveness and attractiveness as a location for business and industry. Weak private investment in Germany is the result of inadequate framework conditions in many areas.

The Expert Commission sees an urgent need for action in a number of areas. Particularly in view of the current demographic trend and economic structural change, the political sector must invest much more in training and qualification than it has in the past and ensure that qualified skilled workers are available. It must reduce the large number of people who have no school-leaving qualification or vocational qualification, enable them in general to obtain a higher level of qualification, continue and expand the

Alliance for Initial and Further Training, and establish a quality assurance system for vocational upgrading training. The fact that Germany's domestic workforce potential alone is not enough to meet the demand for skilled labour makes the immigration of foreign skilled workers significantly more important as a means of securing a supply of skilled labour.

Policymakers should give higher priority to improving women's labour market participation and increasing their chances of being employed. Family-policy measures that counteract this aim should consequently be closely scrutinised. Measures that support this aim must be strengthened and expanded. In addition to the need-based provision of childcare places, investment in expanding all-day schools must be stepped up significantly. This expansion ought to be completed by the year 2020.

A possible instrument for fostering investment is the avoidance of unnecessary bureaucracy. As important as clear government regulations may be for legal certainty, it is equally important to have an appropriate balance that takes the compliance costs for companies into account. Improved legal certainty, tax law that is less complex and more practicable, and efficient government are matters of priority for Germany as a location for innovation.

A further factor is the long-term financing of private investments. The experience gathered during the financial crisis has led to stricter regulation of the financial markets. A closer coordination of the regulation of the financial system with the concerns of the real economy in future would be desirable.

Demand from abroad – alongside stable domestic demand – plays an important role for investment by the private sector. For this reason, maintaining open markets and strengthening trade relations are of key importance for Germany's export-driven economy.

In this day of global value chains, trade agreements and specific investment agreements are ever-larger factors in determining how attractive a particular location is when making investment decisions. For this reason, the European Commission is taking the right approach in principle when, in view of the lack of progress within the WTO framework, it negotiates more bilateral trade agreements with strategically important partners. The establishment of general trade rules and agreements to promote sustainable trade (e.g. through both sides working toward the implementation of international conventions on occupational

health and safety, environmental protection and climate protection) help establish a level playing field and increase the level of planning security of investment decisions in other countries as well. Foreign investment does not take the place of domestic investment or innovation; in fact, in many cases it supplements them. In addition, trade policy should be based on high ecological and social standards, preserve the authority of the respective parliaments, ensure local self-government and the discharge of duties, and boost transparency in global value chains.

B. General conditions for innovation

An important prerequisite for private and public-sector innovation in Germany is an innovation policy that is successful in the international competition over researchers and investments undertaken by research-intensive companies. In addition, a sustainable innovation policy should design effective support measures and subsequently conduct an adequate evaluation of them. Society's openness to and acceptance of risk – which is part and parcel of entrepreneurial activities and innovation processes – are a major determinant in how innovation-friendly the general conditions for innovation are. In order to catch up on a long-term basis with those nations that lead the innovation field, Germany should not target the three-per cent goal in future, but rather gear itself to the research and development (R&D) intensity of the world's frontrunners and strive for a more ambitious goal of spending 3.5 per cent of its Gross Domestic Product on R&D.

The Expert Commission recommends significantly improving the general conditions for innovation in four areas:

- Firstly, **access to external financing** and particularly to equity financing must be significantly improved in Germany. The Expert Commission therefore recommends a system of taxing capital in a way that does not give preferential treatment to outside capital or self-financing over equity financing. A possible starting point for this would be tax deductions for the calculated return on equity as part of a revenue-neutral tax reform. Furthermore, capital-market and regulatory conditions should also be made more attractive so that potential institutional investors are not unduly restricted by regulations.
- Secondly, a shortage of **skilled labour must be prevented**, particularly by promoting subjects in the fields of mathematics, information technology, natural sciences and technology ("MINT" subjects) at an early stage in

the school system. The number of women and immigrants in the innovation system should be increased.

- Thirdly, **innovation policy should be oriented more to facilitating foreign investments in research and development (R&D)** in Germany and preventing a “know-how drain”. The introduction of a tax incentive to promote R&D should be given consideration as a means of establishing internationally competitive conditions for the R&D activities pursued by companies. The aim here should be to ensure that the subsequent added value be generated in Germany.
- Fourthly, a **systematic evaluation** of innovation policy-based funding measures in Germany should be developed and implemented. The establishment of modern evaluation procedures, particularly for innovation policy-based funding measures, is urgently needed in order to ensure the efficacy of such measures and to effectively organise the allocation of public funds.

A major challenge for a successful innovation policy is to identify and take up issues that are of vital importance for the future. An attractive innovation policy is needed in order to drive innovation in areas that will be important to future development – such as in connection with the digital economy and the digital society – and in order for Germany to remain internationally competitive as a location for innovation. In this connection, innovation policy must be formulated so that it complements competition policy and promotes innovation.

5. Private Infrastructure

A. Digital infrastructure

In order to remain competitive, Germany must invest in its digital infrastructure. “Digital infrastructure” here refers to broadband networks, digital services (such as in the areas of healthcare, education, energy, government) and the resulting innovations. Priority must be given to making major investments at broadband network level because the availability and capacity of these networks in Germany are below average compared to international standards and this *digital gap* between Germany and the competition is growing.

The Expert Commission therefore **recommends improving the regulatory framework for investment in broad-**

band networks. One possible option here would be to issue concessions coupled with regulatory requirements and, if necessary, additional government subsidies.

The Expert Commission would welcome an **in-depth discussion of the subject of network neutrality** and its impact on the investment incentives for network and service providers. In order to increase the investment incentives at network provider level, an innovation-friendly definition of network neutrality, as proposed by the Council of the European Union, should be examined. Such a construction must however be combined with a clear framework that unambiguously limits the network providers’ leeway in connection with price and quality differentiation. This framework should include measures to establish a minimum standard for Best Effort Internet and also lay down clear requirements for traffic management.

Government funding measures for the development of new applications and the implementation of pilot projects such as in connection with smart grids or to step up Industry 4.0 will increase the willingness of companies to invest. This also applies to application-oriented research in these areas. The positive effects on investment in new networks should be taken into account as additional instruments for fostering infrastructure development.

B. Energy

Germany’s new energy strategy and the deepening of the internal energy market will require enormous investments – an estimated total of EUR 31 billion to EUR 38 billion a year until 2020 – in order to achieve the energy policy goals of energy security, cost effectiveness, environmental sustainability and public acceptance. Investment is needed in nearly all areas of the energy system: network infrastructure, the generation of energy from renewable sources, conventional generation, energy efficiency, combined heat and power systems, load management and storage technologies. Part of these investments will come from public budgets. The overwhelming part must however be undertaken by the private sector. For the most part, investment incentives can only be indirectly influenced, namely, by creating a positive legal and political environment and by providing incentives or through targeted funding programmes.

For policymakers, the Expert Commission has identified a number of priorities for increasing investment activity in the energy sector and steering it in the right direction:

- **Gear investments in grids and power generation more strongly to serving to the system.** The framework conditions should ensure that the expansion of the grid and the increase in power generation are efficiently coordinated with one another. The resulting incentives for power producers to undertake construction or choose a particular site should also take effect for renewable energy as well in the medium term. This will require decisively pushing ahead the market integration of energy from renewable sources.
- **Increase investment in energy efficiency.** The development of new financing instruments should be examined in order to lower the individual's information and transaction costs by bundling comparable projects and to reduce the individual implementation costs through synergies.
- **Reduce regulatory uncertainty.** Framework conditions that correspond most closely to the aim of cost-effectiveness and harmonise well with the European framework promise a higher level of acceptance and have a longer half-life. As a result, they reduce regulatory risk – one of the main investment disincentives to investment at the present time. It is urged that the key players' subjective perception of the regulatory risk be ascertained, with for example the help of a suitable index, so that appropriate measures can be taken.
- **Increase the level of acceptance.** The aims “cost-effectiveness” and “energy security” – in addition to environmental compatibility and local acceptance – must be a clear focus. Keeping energy prices and costs low while achieving the objectives of Germany's energy reforms is a prerequisite for acceptance among the public and in industry, and preserves Germany's competitiveness as a location for industry. The pros and cons of the various measures should be communicated and discussed in transparent processes with an eye to ensuring acceptance.
- **Make the achievement of defined objectives quantifiable.** Steps should be taken to make it possible to measure cost-effectiveness in order to enable a clear orientation towards this objective. This will require the provision of suitable data which will make it possible to approximate with the help of models the efficiency gains achieved through energy policy measures. External experts should be brought on board to evaluate the different approaches and identify a suitable approach.

C. Young companies

The general conditions for and support of young companies are important tasks for economic policy because it is these companies that make an important contribution to German industry's competitiveness and capacity for innovation. Start-ups, particularly in the area of advanced technology and knowledge-intensive services, exhibit an above-average propensity to innovate. However the number of start-ups is low by international standards and has continued to decline in past years. For this reason, the creation of conditions that are conducive to start-ups is not only important for employment policy – it also constitutes an important prerequisite for a successful innovation policy.

The Expert Commission particularly underscores the following recommendations for improving general conditions and supporting young companies in Germany:

- **Improve general conditions for start-ups:** This will require dismantling bureaucratic hurdles for business start-ups and lowering the regulatory requirements for business founders and young companies.
- **Dismantle barriers to financing:** To achieve this, tax obstacles for private investment in equity capital should be dismantled. The introduction of a European stock exchange segment for young companies could counter the lack of follow-up financing and foster private venture capital investments.
- **Improve the cross-linking and sharing of information regarding intellectual property rights.** The Commission welcomes the introduction of the European patent with uniform protection in all EU Member States and the establishment of a European patents court. These two steps have the potential to reduce the costs for applying for and enforcing international patents and thus facilitating patent exploitation for small and medium-sized enterprises.

6. Europe: Germany's contribution to Europe's investment agenda

Europe still finds itself in a severe economic and financial crisis. Many countries in Europe already have a lost decade to deal with. The risk of further years of stagnation and high unemployment is enormous. Just like Germany, Europe also has weak public and private investment. The level of investment in Europe today is EUR 430 billion less than in 2007 and is considerably less than during the past 20 years. This has an adverse effect on the economy, job creation, and on Europe's long-term growth and competitiveness.

Many crisis-ridden states must implement necessary reforms. However, many countries in crisis also need support in order to become competitive, have a solid foundation for the future, return to a stable growth path and organise their economies to be socially equitable. The key to a sustainable recovery in Europe lies in faster growth that must be bolstered first and foremost through a joint investment and modernisation campaign. Reforms that focus solely on austerity measures cannot succeed.

The Expert Commission welcomes the "Juncker plan" for involving private capital in investments aimed at ensuring future development. It recommends examining the establishment of the Juncker plan for Europe on a permanent basis should it prove to be successful. In order to do this, funding for the European Fund for Strategic Investments (EFSI) on which the plan is based must be increased and a mechanism must be created for recapitalising or expanding the Fund in future, should this become necessary. This however requires a decision-making structure that would protect the EFSI's capital and ensure that the possibility of a future recapitalisation does not lead to imprudent handling of current funds. The EFSI governance structure should be able to fund economically useful projects and, as a result of its assumption of greater risk, mobilise private investment. Steps should be taken to ensure that EFSI guarantees are provided on a straightforward basis with a minimum of bureaucracy.

The investment fields proposed in the Juncker plan are of strategic importance for Europe's future. This type of investment plan for Europe will improve collaboration between the countries of Europe because the enormous challenges involved in shaping the future and in crisis management can be met only on a joint basis. In view of this, strategic investments in broadband networks, a switch to sustainable energy in Europe, education, inclusion, SMEs and mid-cap enterprises should especially be fostered.

Supplemental and divergent positions of the trade unions (IGM, ver.di, IG BCE, IG BAU and DGB) represented in the Commission

Germany has been suffering from a massive investment backlog for years. Most notably public, particularly municipal investments have been cut back in the past. The reason: Tax cuts in previous years have caused tax shortfalls of EUR 45 billion a year at the Federal, state and local level. In addition, fiscal consolidation within the framework of the debt brake and the “black zero” has led to prioritising debt reduction over investments. The result is devastating: Public spending has been slashed. Many public services fell victim to the red pen or were privatised, charges have been raised and user fees were introduced. Many public services have become unaffordable for low-income earners. In short: Germany has switched from investment to savings mode. The debt brake followed a de facto investment brake. That needs to change in the interests of the future of our country. Therefore, Germany must invest in its future again and for a competitive, innovative economy and for a sound, social and green community. Today’s investments are the jobs and prosperity of tomorrow. Their financing must be equitable and cheap in an historic low interest rate environment in order to leave both behind to future generations: A modern and sound economy, infrastructure and society that at the same time however does not take a heavy toll on the public budgets in the long term. Therefore to strengthen investments in Germany, we propose a “Pact for Equitable Financing and Implementation of Public Investments,” which represents a differing position on the following points:

A pact for equitable financing of public investments should include this prioritisation:

- Public investment must be financed primarily from taxpayer money. To fairly distribute the burden, the previous tax privileges for very high assets, incomes and inheritances should be rescinded again and the additional revenue gained from this should be allocated for public investments.
- Furthermore in light of an unprecedented low interest rate environment of only 0.2 per cent for long-term federal debt, credit financing – especially in the interests of future generations – could be a cheaper way to modernise the infrastructure. In 2014 alone, the state could have exploited the leeway for debt of approximately

EUR 35 billion without violating the legal requirements of the debt brake. For 2015, it will be an estimated EUR 18.6, for 2016 EUR 17.8 and for 2017 EUR 13.1 billion (source: BMF, Monthly Report March 2015). In addition, it makes sense to implement the Expert Commission’s (SVR) proposal and to exclude public investment into the infrastructure from the debt brake.

- Additionally and only when all of these financing options have been exhausted should the new financing instruments proposed in this report be examined such as a public infrastructure fund for local authorities or a citizens’ fund. Even then the following applies: Private financing may not be significantly more expensive than direct borrowing by the state. Private financing is always more expensive compared to the above alternatives. To minimise this disadvantage, we propose: The infrastructure financing fund or a citizens’ fund should remain fully publicly owned and be furnished with sufficient equity capital, a government guarantee and its own income. The fund can issue bonds that can be placed on the market via auctions and purchased by institutional investors like banks and insurance companies as well as by private households and small savers. The refinancing of loans can take place either through future revenues from the planned financial transaction tax or from budgetary resources and user fees such as a toll for example.
- To ensure a targeted use of budgetary resources for infrastructure investments, it would be useful to examine the establishment of a budgetary commitment to public investment at a certain amount that at least compensates for the depreciation of public sector assets. Such a commitment of public funds must not come at the expense of employees, public employment, government functions or other public spending.

Provision of Public Infrastructure (Sections 3A and 3B)

In order to increase financial leeway for local authorities, the Expert Commission (Section 3A) proposes the creation of an “Infrastructure Company for Municipalities” (IfK) financed by the Federal and Länder governments, or alternatively several regional or infrastructure-specific companies. On the one hand, this helps local authorities to determine the most cost-effective procurement method (either conventional or PPP) and to assist them in implementing the projects. We have a differing view of PPP than in the report, not seeing it to be an efficient and more cost-effective alternative to conventional procurement for the following reasons:

- As a rule, PPP projects are not realised because the public sector wants to hedge against investment risks, but because it sees PPPs as a stopgap solution for lacking budgetary resources at the municipal level. Additionally, safeguards against construction risks can also be put into place within the framework of conventional procurement. PPP projects are subject to particularly large contractual risks because of their long durations.
- The view that PPP projects are characterised by better economic efficiency, schedule adherence or an improved risk analysis in comparison to conventional procurement is not in line with present economic theory and empirical findings.¹ Even in Great Britain, the country with the most extensive experience in the application of the PPP approach, PPP projects can result more in cost increases, according to the results of an investigation commission of the British House of Commons.² Before the implementation of PPP projects, realised economic feasibility studies have not been carried out objectively as a rule up until now and have been distorted to the benefit of PPPs.
- Reports from the Bundesrechnungshof and state audit offices confirm that PPPs involve higher costs and also often come with higher risks.³
- The introduction of a mandatory efficiency examination like the report recommends is not necessary because the existing requirements are sufficient and common practice (cf. § 7 BHO, the instructions of the Federal Ministry of Finance from 12 January 2011, the advisory opinion of the Federal Commissioner for Efficiency in Administrative from 2013 or the German Länder’s corresponding guidelines).
- The trade unions do not share the representations of conventional procurement formulated in this report (Section 3A, Problem Analysis, b. Efficiency Problems, p. 41 pp.). Therein, defective or missing economic feasibility studies related to local construction investment projects with cost increases and/or schedule delays of over 50 per cent, defective or missing risk analyses and an often ascertainable distortion of expenditure patterns at the expense of maintenance investments are ascribed to local authorities.
- In addition to this, the report recommends the founding of infrastructure companies (IfKs) that are connected with mandatory economic feasibility studies for projects of a certain size. The IfKs in their capacities as an optional service provider that all local authorities can turn to should be assigned far-reaching responsibilities such as project management, calculation of demand, profitability analysis, tendering and negotiating with contractors. For the trade unions, it is crucial that human resource and institutional capacities of municipalities be strengthened again regardless of a possible formation of infrastructure companies, so that pre-planning, the building contractor function and project steering can be executed locally and this with the

1 Cf Beckers et al. (2014), Hodge and Greve (2009).

2 Cf House of Commons (2010).

3 Cf Präsidentinnen und Präsidenten der Rechnungshöfe des Bundes und der Länder (2011), Bundesrechnungshof (2014).

involvement of the local crafts, construction and financial sector. That would be a paradigm shift away from the years of sustained depletion of know-how and personnel at the local level. The decision-making and implementation powers have to remain within the local administrative and policy-making context during all of the considerations. This is already warranted by virtue of the imperative of local self-government as a basic principle of democracy, which enjoys constitutional status by the guarantee of self-administrating in Art. 28 par. 2 of the Basic Law for the Federal Republic of Germany. If IFKs are established, special attention needs to be paid to their neutral alignment, and in this context – particularly against the backdrop of the national and international IFKs that in practice have been exposed to have comprehensive (misguided) incentives and are not acting neutrally – public law organisational structures are to be chosen. Central guidelines for the implementation of profitability analyses that purposefully and improperly favour the PPP approach are to be rejected. Encroachment on the decision-making sovereignty of the German states and local self-government should be rejected.

In the Commission’s report (section 3B), an infrastructure company for federal trunk roads (transport infrastructure company) is proposed similar to that for a municipal infrastructure company. For this purpose, we consider the following construct to be target-oriented, which should be examined by the Federal Government:

- An infrastructure company for federal trunk roads (transport infrastructure company) could be formed based on the regionalised ASFINAG model and must remain wholly owned by the Federal Government in order firstly to avoid conflicting objectives between financing and completion and secondly to keep public control of the federal trunk roads completely in the public interest. Private capital can be used in the financing of transport infrastructure investment through the purchasing of bonds and securities. Alongside this, it would also be useful to test the Swiss model of financing for transport infrastructure to see whether individual elements of it can be used in Germany.
- Construction, maintenance and operation of federal trunk roads “from one set of hands”, whereby existing state administration and road construction companies will be retained and used as the project-executing agency.

- The planning will continue to be based on the Federal Transport Infrastructure Plan and the Federal Government’s requirements plan.
- The company needs its own borrowing capacity. Whether with or without a state guarantee, whether within or outside of the budgetary framework, this should be subjected to legal review; this also pertains to the legal form of the company. Trade unions prefer the variant within the budgetary framework with a government guarantee and in the form of an institution under public law (thus it is also possible for a withdrawal from the area covered by the debt brake according to 115 GG).
- Furthermore, the transport infrastructure company could also act as a level of function between the Federal ministry and state administration, and assume tasks within the framework of central knowledge management. These include data-collection, steering and controlling systems, standardisation and cost management, and wherever necessary coordination of large-scale projects.
- Financing comes from user fees without necessitating an additional burden on car drivers, and from binding, sustainable subsidies from the Federal budget. Moreover, long-term financing with priority funding channels should be considered (for example: debottlenecking).
- To eliminate “privatisation” of federal trunk roads in any form in the future, such must be prohibited by law.
- It makes sense to evaluate the potential distribution and transport policy effects of switching to user funding by tolls.
- The previous infrastructure companies (DEGES and VIFG) are to be evaluated.

Tax policy proposals

We do not share the bulk of the tax policy proposals contained in the report and see no significant correlation between the current lack of private investment and tax legislation. The lack of private investment in Germany is fundamentally attributable to relatively weak aggregate demand and also partly to uncertain profit expectations due to unclear economic policy guidelines, for example in energy policy. Also, applicable tax law structurally weakens

the financial base of the public sector and relieves the already tax-incentivised factor of capital at the expense of the factor of employment.

- In contrast to the report, we see that the task of tax policy is rather to abolish the tax privilege resulting from the 25 per cent withholding tax and not to extend this further to a portion of company profits. The proposal (in the figure: “Financing Innovative Enterprises: Implementation Possibilities”) aims to be able to split up corporate profits into an imputed return on equity and the remaining profits. The return on equity should be exempt from corporation tax, trade tax or income tax in the case of non-corporate businesses and self-employed persons, and taxed similarly to borrowed capital. This would imply that the portion that is exempt from corporate tax would only be covered by the 25 per cent withholding tax. On the other hand, we are calling for abolishment of the withholding tax and taxation on all forms of income at the personal income tax rate.
- Also not supported are the demands for the expansion or utilisation of loss carryovers, the reintroduction of declining balance depreciation, the constraint of the additions in business tax and tax breaks for financing funds.

→ Overall, the tax proposals contained in the report would have resulted in sensitive tax shortfalls if the tax revenue neutrality required in the report had not been financed by other tax revenues. That would then weaken the financial basis of the public sector and massively compromise the financing of public investments. However, the report contains no proposals for a fairer taxation on all forms of income, especially income from assets, in order to strengthen the financial basis of the public sector.

→ Financing conditions for enterprises are extremely favourable at present and for the foreseeable future. The capital base of enterprises has improved significantly in recent years as a result. On the other hand, interest rates for companies that rely on borrowed capital are at a historical low. It is also important to note that sales revenues after tax are at a very high level. There is therefore no need for additional tax relief.

Conclusion: The trade unions always reject tax proposals that would generally result in a shift of the already unequal tax burden on labour and capital at the expense of not only labour but also the public sector.

1. Weak investment in Germany: Taking stock

Investment is the foundation for an economy's growth and employment. A modern capital stock forms the basis for technological progress, ensures a country's competitiveness and thus allows for entrepreneurial success and sustainable development of highly qualified employment. In order for Germany to be able to provide prosperity and employment for future generations, investment needed for tomorrow must be made today.

Through public investment, the state is tasked with ensuring the maintenance and development of infrastructure to meet the demands of society and to create the adequate framework conditions for private investment and economic growth.⁴ The amount of investment required is determined not only by the size of the existing capital stock and the funds necessary to maintain it, but also the challenges of the future. Especially for Germany, these include the transition to an affordable, secure and environmentally friendly energy supply, the increasing digitisation of the economy and society, and the demographic changes expected in the next decades.⁵ Even though a decreasing labour force necessitates a smaller capital stock, specific and comprehensive investments are also required at the same time to meet the changing conditions of an ageing society.

Against this backdrop, the German Government has set out plans in its coalition agreement for the 18th legislative period to create the necessary framework conditions for innovation and competitiveness in Germany and to bolster investment activity.⁶ It set itself the target to significantly increase private and public investment in Germany and to at least reach the average investment rate of the OECD countries, which rose to three per cent of economic output in 2013. The Independent Expert Commission on Increasing Investment in Germany has been entrusted with the task to show the ways and means to stimulate private investment in Germany and to increase and improve public investment in critical areas. The Expert Commission is presenting its results in the current final report.

The following chapter provides the foundation for the report by summarising the most important facts on trends in investment in Germany and Europe based on the latest data. It also answers the questions as to in which ways Germany is suffering a lack of investment, and where there is a particular need to catch up.⁷ Chapter 2 focuses on the fundamental question as to which extent could the sustainability of public investment in Germany be fundamentally improved by changing legal or institutional mechanisms. Based on these two chapters, the rest of the report is devoted to individual investment fields and devising recommendations for action.

Investment as key indicator of economic growth

The most important determinants for an economy's potential growth are the change in labour resources and the development of capital stock, and with this investment activity. Furthermore, the amount of total factor productivity (TFP) is crucial for the development of potential growth. This includes those parts of economic growth that are not immediately a result of the input factors labour and capital, but that are based on technological improvements and changes to resource exploitation. Investment and innovation are therefore essential to an economy's competitiveness. When investment activity is correlated with existing fixed assets (intensity of investment), it provides information about the level of modernity of the capital stock. If it is also assumed that modern facilities (buildings, equipment, research capacities) are more efficient than older ones, as they imply future competitive advantages.

Included in innovations are all those activities that produce, adapt and successfully implement innovations in the economy and society, and thus directly increase social welfare. Innovations are the result of complex interactions between

4 Cf IMF (2014).

5 Cf OECD (2014e).

6 Cf Coalition agreement between the CDU, CSU and SPD (2013).

7 The analysis is based on Alm and Meurers et al. (2015); Baldi et al. (2014); Bach et al. (2013).

individuals, organisations and their work environment. To foster innovation, it is necessary to obtain a wide variety of technological skills in Germany and to focus scarce resources on appropriate future-oriented fields. Companies and government bodies all over the world spend huge sums of money on research and development. Compared internationally, Germany is doing quite well. However, Germany has still not reached the Lisbon target of using 3 per cent of GDP for research and development (R&D). Moreover, it is undeniable that other countries, especially in Asia, have made considerable efforts in recent years to reach or exceed this goal.⁸

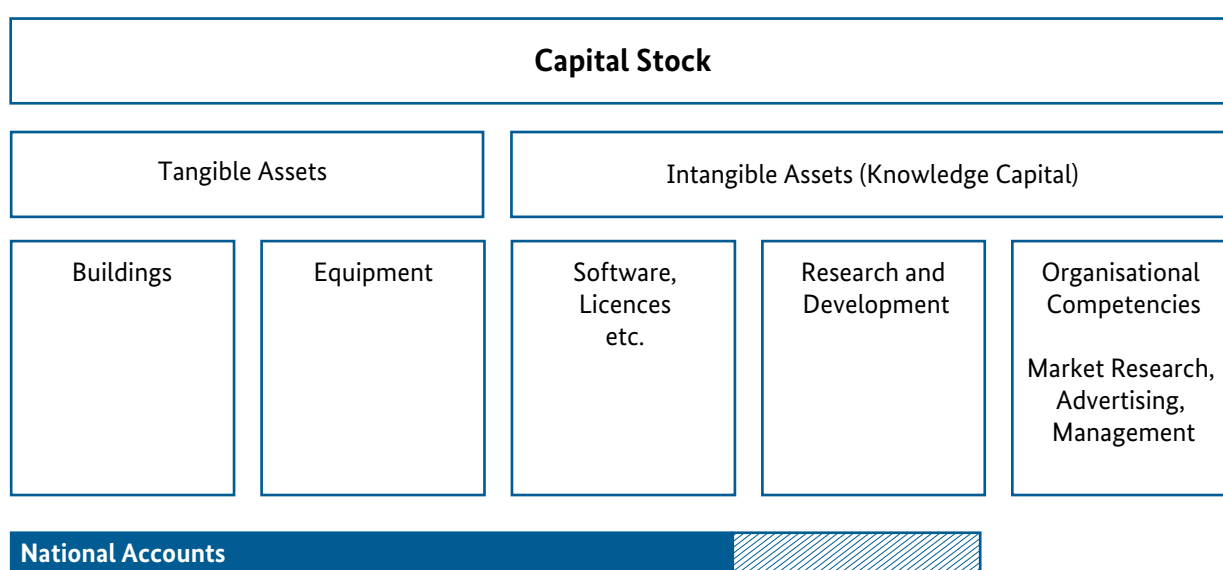
Difficult quantification of investment activity

If an attempt is to be made to quantify investment activity within an economy, it must first be determined which expenditures can be classified as investments. The definition of the concept of investment is however in no way distinct. Business administration defines an investment as a

long-term commitment of financial resources in the form of tangible or intangible assets. However in the system of national accounts (VGR), which is the main source for the quantification and analysis of overall investment activity, gross fixed capital formation includes the purchase and in-house creation of permanent and reproducible means of production. The definition of investment has been reformed several times in national accounts over the past years. In addition to material investments in tangible fixed assets such as buildings and equipment, successive changes in intangible assets in the field of intellectual property as investments have been assessed. These include in particular software and databases, research and development, and intellectual property rights.

Furthermore, when determining investments and capital stocks using organisational sources such as market research, advertising and management, one must rely however on scientific analyses. (see Figure 1-1).⁹ The classification of educational spending as investments is also a controversial issue. Crucial here is expenditure for educators. In the official statistics, expenditures for education are only designated as investment if new real capital is created. This means

Figure 1-1: Definitions of capital stock and investment



Source: DIW Berlin, HRI (2014).

⁸ Cf Corrado et al. (2009); Corrado et al. (2012).

⁹ Cf Corrado et al. (2009); Corrado et al. (2012).

that investment in the education sector can only be considered as such if it is placed in buildings (such as universities, schools and kindergartens) or institutions that are directly related to research expenditures.

Weak investment in Germany and Europe

Restrained investment activity has characterised Germany and Europe for many years.¹⁰ In Germany, gross fixed capital formation has developed relatively well with an increase of just over three per cent in 2014 after a two-year decline. However, this is largely due to a very strong first quarter in 2014. The development of private investment in machinery and equipment, on the other hand, remained weak on the whole in 2014. It was still about ten per cent or almost EUR 20 billion under the corresponding value from 2008.

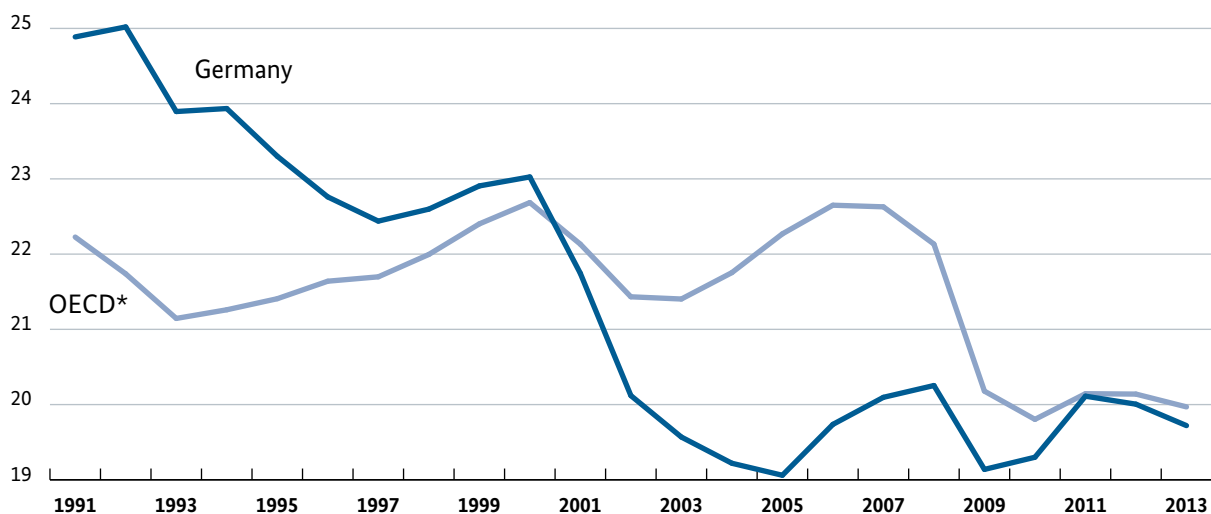
One important reason for this development is likely due to the gloomy economic situation in the wake of the Euro zone crisis. In the winter of 2013/2014, investment revived,

but this was only temporary and it experienced a setback again during the course of the year. Momentum is likely to remain low according to forecasts. This development suggests that investment relative to economic output will not reach the level of before the financial crisis for the time being. The joint forecast from the Economic Research Institute predicts gross fixed investment will account for about 20 per cent of Gross Domestic Product (GDP) in 2015.

However, the lack of investment is not only an economic, but also a long-term phenomenon. Even though this emerged in Europe particularly after the economic crisis, in Germany however, investment activity in relation to the economic output (investment rate) has been losing momentum continuously since reunification (see Figure 1-2).

Investment weakness is also reflected at the international level. The German investment rate has been below the rates of many other European countries for some time. Even compared to non-European countries such as the United States, Japan and Australia or the OECD, not just Germany, but meanwhile all of Europe is lagging behind.¹¹

Figure 1-2: : Investment ratios compared internationally
Nominal investment ratio (% of GDP)



*OECD averages without the countries Chile, Japan, New Zealand and Turkey
Source: European Commission, calculations from the DIW Berlin

10 Cf DIW and HRI (2014).

11 Cf Gornig and Schiersch (2014); Baldi et al (2014).

On the basis of these findings, a broad discussion has been started about the appropriate level of investment in Germany and Europe.¹² An emphasis has been placed on identification of the reasons and estimates for the level of investment weakness. The debate, however, is complicated by the lack of selectivity in the definition of investment.

From the economic perspective, a distinction between public investment that is directly determined by state and private investment, which is influenced by the state through the establishment of framework conditions, would appear useful. The discussion is also made more difficult because the efficiency of invested funds cannot be directly inferred from the amount of investment and therefore high investment must not be evaluated positively per se.

Large deficits in public investment

Public investment in Europe fell sharply after the financial crisis in the wake of the dramatic consolidation of public budgets. Particularly in southern European countries, fiscal restrictions remain high and public investment is accordingly low.

Even in Germany since the end of the 1990's, investment in public infrastructure in particular has been gradually cut back in relation to Gross Domestic Product.¹³ There are several reasons why the observed effect could be exaggerated to a certain extent:¹⁴ For one, the boundaries of the public sector were redefined in the 1990s because some economic activities were moved into the business sector. On the other hand, the higher levels in the 1990s were primarily due to reunification. Nevertheless, international comparison shows that the trend in state investments in Germany is not any worse over time, but that the overall level is significantly lower than in comparative countries.¹⁵ Admittedly, a

part of this difference can be explained by the definitions used for the public sector, but significant differences in the levels remain. Outside of Germany, only Austria, Belgium, and Switzerland have experienced declines in gross investment. In most Euro zone countries, the EU and the USA, public investment has remained almost constant over the years.

Within Germany, most notably municipal investment has been cut back again and again. The portion of the expenditure on investment accounted for by municipalities dropped by one-half, from over 20 per cent in 1991 to 10 per cent in 2013 (see Figure 1-3, left). This is the result of an expansion in municipalities' responsibilities in the area of social security.

Last but not least, the outsourcing of public investment into the private sector plays a crucial role. As a result, for example, gross fixed capital formation in the field of waste management was not subtracted from this amount in revisions of the statistics. Nevertheless, it should be noted that net investment (gross investment minus depreciation) of cities and municipalities has been negative since 2003 (see Figure 1-3 on the right). Local authorities' net fixed assets decreased by EUR 46 billion between the years 2003 to 2013.

The weak investment by local authorities has led to a significant increase in investment requirements.¹⁶ The investment deficit had grown to a total of EUR 118 billion by 2013 according to the treasurers and those responsible for local authority finances in cities, municipalities and counties. The largest investment needs are in the areas of roads and transport infrastructure, administration and schools (see Figure 1-4). The maintenance, renovation, expansion, dismantling and conversion of buildings accounts for around EUR 65 billion of the backlog.

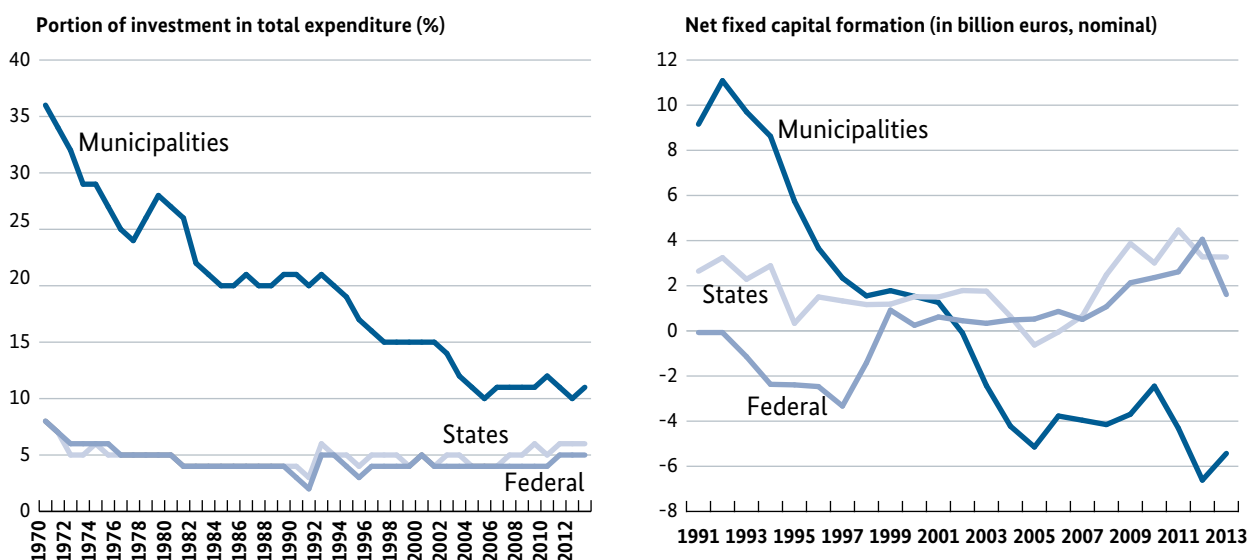
12 Cf Sachverständigenrat zur Begutachtung der Gesamtwirtschaftlichen Entwicklung (2014); Deutsche Bank Research (2014); DIHK (2014c); BMWi (2014e).

13 Cf IW Köln (2014); ifo Institute Dresden (2013); IMF (2014).

14 "In adapting to the new delineation of the state sector in accordance with the European System of Accounts 1995 (ESA 95), the federal, state, municipal and local authority association providers of supplemental pension schemes and hospitals and university clinics with commercial accounting systems was no longer included in public budgets beginning in 1998. Since then they have been grouped together with public enterprises." Federal Statistical Office, specialist series 14, series 3.1, 2010, p. 14. As a result, investment by the relevant institutions is no longer assigned to the state.

15 Cf Bach et al. (2013).

16 Cf Reidenbach et al. (2008); IW Köln (2014).

Figure 1-3: Government investment in total and according to local governing bodies

Note: Changes in the definition of investment only allow for limited comparisons in the time prior to 1991; only West Germany up until 1990f.
Source: Federal Statistical Office, calculations from the DIW Berlin

A quantitatively and qualitatively more efficient transport infrastructure is a fundamental requirement for economic success and prosperity of the German economy with its high degree of labour division and its location at the centre of Europe.¹⁷ The transport infrastructure represents a considerable stock of economic capital with a gross stock of fixed assets valued at almost EUR 780 billion. It constitutes about six per cent of the gross stock of fixed assets for all economic sectors in Germany.¹⁸

This means that there is a substantial neglect of investment in the maintenance and quality of transport infrastructure. This has been determined by commissions and scholarly studies commissioned by the German Government. These show that the transport infrastructure has been suffering from a significant investment backlog for some time.¹⁹ According to this, the additional investment needs necessary for maintenance alone are from EUR 3.8 billion to EUR 4.6 billion a year. Taking into account the backlog demand from years of insufficient maintenance invest-

ment, additional annual investment would need to rise from EUR 6.5 to EUR 7.2 billion.^{20/21} In addition to this, there are investment demands relating to motor vehicles, which are difficult to estimate, as well as selective network and capacity expansion.

Alongside equipping the country with physical capital, the German economy needs an efficient public education and social security system. Although spending on education and social inclusion technically only accounts for a small portion of investment within the meaning of national accounts, it is nevertheless a key factor for safeguarding the future. To the extent that comparative international studies allow quantification, Germany spends only small sums on education and social services in relation to its GDP. Thus, state spending on education per child is significantly lower than the amounts spent by most other OECD countries.²²

17 Cf IW Köln (2014); Daehre Commission (2012).

18 Cf Kunert and Link (2013).

19 Cf Pällmann Commission (2000); Bodewig Commission (2013); Daehre Commission (2012); Kunert and Link (2013); IW Köln (2014).

20 Cf Kunert and Link (2013).

21 Cf Daehre-Kommission (2012).

22 Cf Spieß (2013).

Deficits in private investment

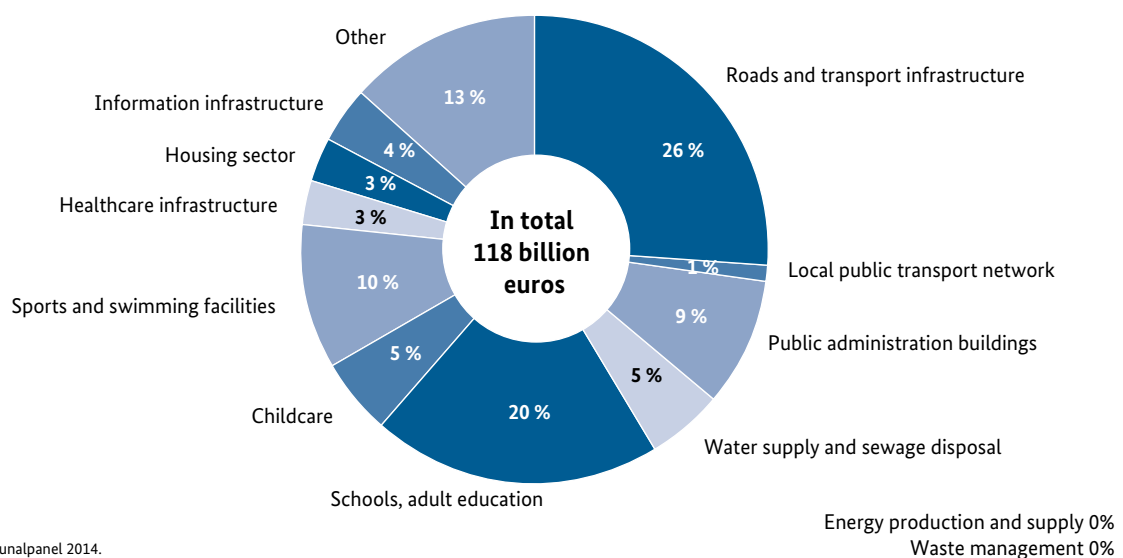
Private investment has developed weakly in Germany over the past few years: Net fixed capital formation (excluding housing) in non-governmental sectors has declined every year since the early 1990s, from over EUR 80 billion to only around EUR 13 billion in 2013 (see Figure 1-5). At the same time, a differentiated approach to the development of net fixed assets in individual economic sectors indicates different trends. Not surprisingly, net fixed assets have increased steadily in the service sector because of the general change in the structures over the course of time. For manufacturing enterprises, however, this amount has barely grown since reunification. Even if investment in research and development in many industries has developed in a positive direction, capital stock in the manufacturing sector has shrunk by three per cent since 2009 overall.

In particular, energy-intensive industries have showed a weak investment trend in recent years. Companies in these areas have not fully reinvested their capital consumption allowances in Germany since 2001. These deficits add up to a difference of EUR 13 billion from capital stock in 2001. The pressure to relocate industrial sites remains high due to

rising energy costs in Germany.²³ This gradual change has serious implications. From an economic perspective, an important function in ensuring competitiveness and employment in Germany is performed by business start-ups. It is to be expected that young companies are characterised by high investments in the first years after their founding. Current assessments by the KfW-Mittelstandspanel confirm that younger business owners have invested significantly more often in the past ten years than entrepreneurs in other age groups. Nevertheless, the portion of young entrepreneurs has plummeted due to the lack of young talent.²⁴ Furthermore, it is striking that the development of the portion of young entrepreneurs has been very subdued since 2006. This finding corroborates the fact that compared to countries with more start-up activity very little venture capital is being invested in Germany, especially in those countries in later phases of growth: In France (EUR 13.10 per capita), investment in companies in the “growth” phase was about three times as high as in Germany (EUR 7.39) during the period from 2008 to 2013. In Great Britain (EUR 19.51), it was even almost four times as high.²⁵

Estimates of an existing lack of investment in Germany come directly from the corporate sector. According to a representative survey, a narrow majority of executives in Ger-

Figure 1-4: Perceived investment needs of local authorities

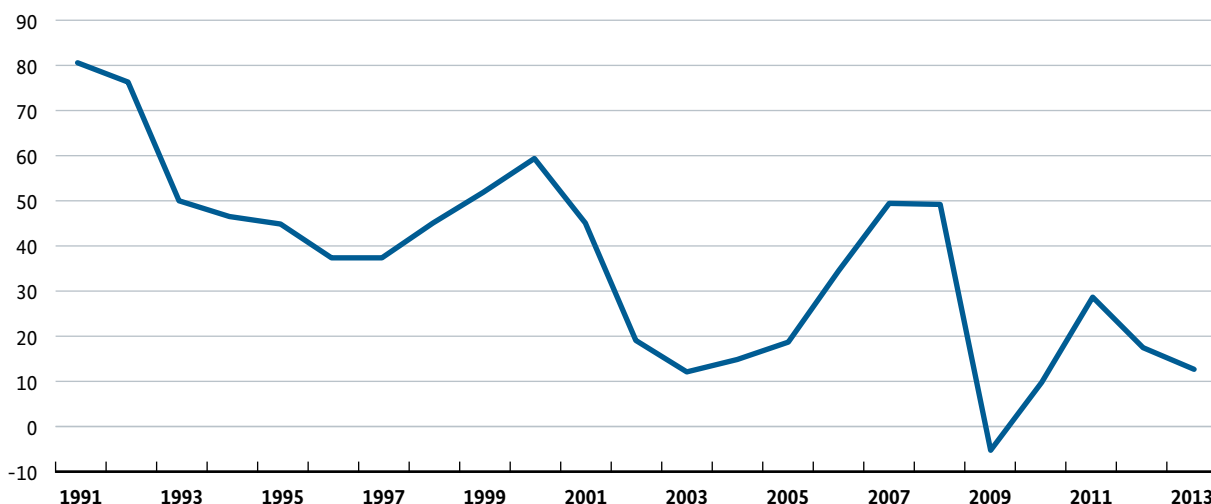


Source: KfW-Kommunalpanel 2014.

23 Cf DIHK (2014d).

24 Cf Schwartz and Gerstenberger (2015).

25 Cf BVK et al.; EUROSTAT; eCAPITAL Analysis (2013).

Figure 1-5: : Development of net private investment*

*Net fixed capital formation without housing (non-state sectors, in billion euros at current prices)
Source: Federal Statistical Office, calculations from the DIW Berlin

man companies complained of an investment deficit in this country. Of the executives that believe that too little is being invested in Germany, 27 per cent think that the state in particular is not investing enough; 36 per cent are of the view that both the state and the companies are investing too little; 27 per cent blame this on too little investment by companies.²⁶

The modernity of capital stock is decreasing

The existing capital stock has a significant influence on investment needs and thus expected investment activity in a country. To keep this efficient and competitive, there must be a sufficiently high level of investment.²⁷

The production potential of a modern economy is characterised less and less only by the physical capital stock, how-

ever. Today, knowledge capital is an important company resource in quality competition. In a series of analyses, investment in and stocks of intangible assets are therefore being taken into account.²⁸ Firstly, these include intellectual property assets, which in particular means investment in research and development. Since 2014, these assets have been recorded in official statistics as investments. Secondly, there are organisational skills, which are attained by investment in marketing, market research, design, operational training and further education and management skills.²⁹

According to current estimates, the intensity of investment and the modernity of the capital stock are low in Germany when compared to other large economies. In the 1990s, Germany was still virtually neck and neck with the United States and the United Kingdom, but at present a significant gap has opened up in relation to these countries. Only in France is the intensity of investment still lower than in Germany (see Figure 1-6).

26 Cf DIW Berlin and HRI (2014); IW Köln (2015).

27 The relation between gross capital formation and existing real capital stock, an important indicator for an economy's future competitiveness, see Gornig and Schiersch (2014).

28 Cf, e.g. Corrado et al. (2009); Corrado et al. (2014).

29 Quantified data on this are provided by various scholarly research projects funded by the EU such as INNODRIVE, COINVEST or SPINTAN.

Germany has performed well in recent years in terms of the modernity of R&D capital stock. In contrast to other investment, investment in R&D per capital stock has been higher than in the three comparative countries since 2010.³⁰ The gaps between the countries are relatively small overall, however. This also applies to intensity of investment in organisational skills. Here, only the United States has a significantly higher level of modernity of capital stock.

The largest amount of capital stock in all countries is by far real physical capital. Empirical analyses show that Germany's deficit in the modernity of capital stock is a long-term problem that spans many sectors. In almost all sectors, Germany's capital intensity is below the EU average, which is in turn far below the amounts in non-European OECD countries such as the United States. These observations suggest that the low degree of modernity exhibited by the physical capital stock poses a risk to business in Germany. This is particularly true because the degree of modernity is lagging more and more behind the major competitors even in sectors that have been successful in the past years like the key industries of automotive manufacturing, mechanical engineering and chemicals.³¹

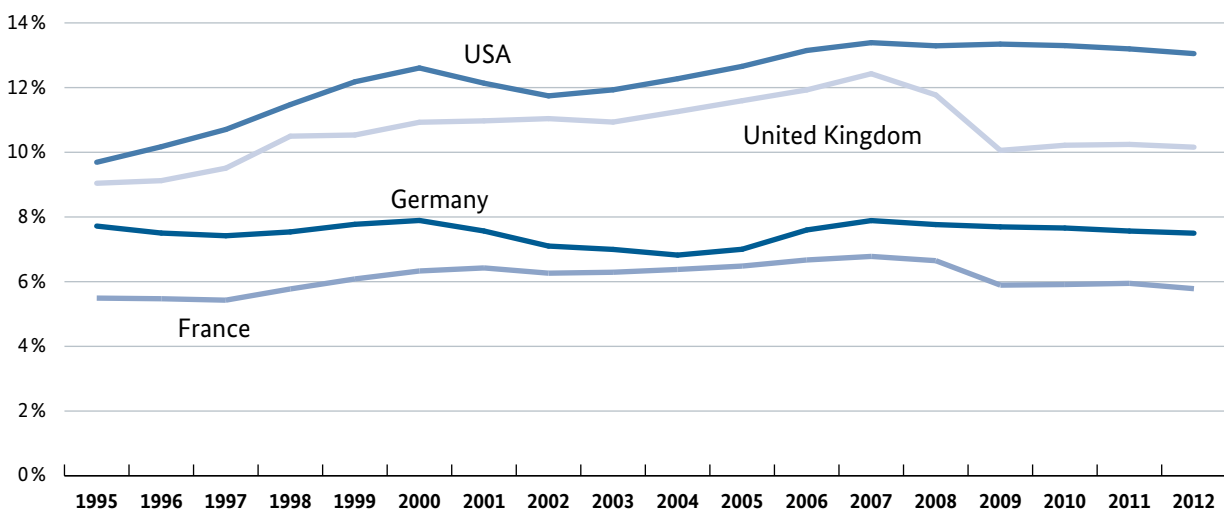
Conclusion and perspectives

A look at investment activity in Germany points towards a lack of investment both in terms of private and public investment. Of particular importance are major problems in the maintenance of public infrastructure. Especially in the transport sector, there is an urgent need for action due to the ongoing backlog in investment. Investment at the local authority level has been especially weak for about ten years. Here, there is a particular need not only in the transport sector, but also in education and social services.

Private investment has developed weakly in Germany over the past few years. Private net fixed capital formation declined sharply from 1990 until 2005 and since then it has been at a low level of about two per cent of GDP. The modernity of German capital stock is low compared to other large economies. Energy-intensive industries as well as young companies have a particularly weak level of investment – especially in comparison to Europe.

Overcoming these weaknesses requires a broad approach. The report focuses firstly on analysis and recommenda-

Figure 1-6: Investment in relation to capital stock



Source: WIOD, calculations from the DIW Berlin.

30 Cf Gornig and Schiersch (2015).

31 Cf Gornig and Schiersch (2015).

tions for action in the area of public investment in infrastructure, especially at the municipal level and in the area of federal trunk roads. Investment there would provide a significant stimulus to more private investment – on the one hand through demand effects, but also as an advance concession on further investments, for instance by maintaining and improving the provision of infrastructure, because it is the provision of infrastructure that conditions attractiveness for private investments in Germany. The investment requirements identified especially at the local level will rise sharply in the next few years in order to be able to then decline significantly in several years as predicted.

The following chapters address other framework conditions for private investment. Special emphasis is placed on the availability of equity capital and – in relation to this – the development of investment-friendly corporate taxation. Investments in the energy sector and digital infrastructure, which lie at the interface between public and private investment, are also discussed. In order to keep the capital stock modern and to ensure the long-term competitiveness of industry, greater investments are however not only necessary in tangible fixed assets, but above all in “minds”. The ability to innovate is of key importance for the future viability of business in Germany. Germany is indeed well positioned here, but it must assert its leadership. Special challenges arise especially with regard to the promotion of innovative young enterprises, which do not always face the best development conditions in Germany. These topics are addressed in separate chapters.

The lack of investment identified in this chapter is definitely not a purely German phenomenon, however. At present many other countries in Europe are exhibiting a low level of public and private investment. Therefore, strategies for more investment in Germany should be supplemented by European investment initiatives such as the Juncker plan. The final chapter of the report is devoted to this topic.

2. Mechanisms for securing sustainable public investment

In times of tight finances, public investment often sinks disproportionately. This is especially the case if the shortage is a result of increasing social services spending, which in the past resulted in part from the shifting of tasks from the federal to the local authority level. That has been the case for many local authorities in the last years.³² However, declining investments can also be a consequence of different degrees of flexibility for individual budgetary positions.³³ If the regional authorities have to cover funding gaps because actual tax revenue is behind the tax estimate projections, then they are faced with the problem that a large part of state consumption and state transfer payments may not be available in the short term for legal reasons. Public investment projects are often delayed or cut out completely as a result. This biases the structure of government spending at the expense of public investment.

The Expert Commission has therefore intensively addressed the question whether and how this bias can be countered with investment-oriented rules or institutions. Ultimately, the aim of state “commitment” should be in the direction of sustainable investment. Such approaches have a long history in Germany, but so far they have only had limited success. This history is briefly discussed in the following. The rest of the chapter describes the existing legal framework and discusses how a fundamentally stronger orientation towards investment can be reached starting from this legal framework. This leads to institutional approaches that will be discussed in more depth in Chapter 3.

Experience with investment orientation by way of the Constitution

The “golden rule of fiscal policy” holds that the state is allowed to run up debt to the extent that this allows it to increase the standard of living for future generations. This emanates from the imperative that debt be sustainable. Debt which increases future income can therefore be repaid more easily.

The Basic Law’s debt rule, which applied up until 2009, interpreted the “golden rule” in such a way that debt could

only be justified if it financed government investment. Article 115 (1) (2) of the Basic Law of the Federal Republic of Germany (old version) stipulates: “Revenue obtained by borrowing shall not exceed the total of investment expenditures provided for in the budget.” The credit limits set out in the constitutions of the German Länder were similar until the revision of Article 115 and 109 ff of the Basic Law within the framework of the second reform of the Federal system.³⁴ The Länder also oriented their municipal investment levels towards national debt as well.

The decline in municipal investment activity and various infrastructure bottlenecks described above can also be witnessed at the federal and Länder levels, however – with a simultaneous increase in the debt ratios of the federal and Länder governments as well as a constant debt ratio among municipalities as a whole. The old legal situation was therefore neither able to prevent the surge in national debt in Germany, nor make sure that public investment kept pace with this debt. On the contrary, they were moving in opposite directions.

One aspect probably contributing to this development was that under Article 115 (1) (2) of the old version of the Basic Law, exceptions were allowed if there was “a disturbance in the macroeconomic balance” without more detailed specifications defining these exceptions motivated by economic policy being laid down. In addition, Article 115 (2) of the Basic Law (old version) allowed exceptions from Article 1 for special federal funds, which were merely to be determined under federal law. Last but not least, the fact that budgetary planning and implementation were not interlocked together may have played a role. Funding deficits, which occurred because of higher projections of what turned out to be lower revenue, were therefore accepted without immediately restricting budgetary margins for the future.

Apart from their lack of effectiveness, there was another problem with the old debt rule in the budgetary apportionment of public investment. Under Section 13(3)(2 a-f) of the Federal Budget Code (BHO), public investments are expenditures for

32 For a detailed description see Chapter 3.A.

33 Cf for budget flexibility in Germany as far back as Pommerehne and Feld (1994).

34 Cf Sachverständigenrat zur Begutachtung der Gesamtwirtschaftlichen Entwicklung (2007), p. 65.

- a. “construction measures, insofar as these do not relate to military installations;
- b. the acquisition of movable assets, unless budgeted for as non-personnel administrative expenditures or unless the expenditures are expenditures for military procurement;
- c. the acquisition of fixed assets;
- d. the acquisition of holdings and other capital assets, of claims on and equity interests in enterprises, of securities, as well as on increasing the capital of enterprises;
- e. loans;
- f. recourse to guarantees;
- g. grants and subsidies to finance expenditures for the purposes designated under letters a) to f) above.”

Excluded from this definition are various government activities which may indeed be of an investment nature within the meaning of the “golden rule” because they can be regarded as advance concessions for private investment or otherwise increase the standard of living for future generations. These include, for example, expenditures on education, which can be understood as investment in human capital, as well as healthcare expenditures or expenditures on the legal system. Conversely, it is not clear if all investment spending set out by the BHO will actually lead to higher future income.

The German Council of Economic Experts (SVR) therefore sought to apply this notion of investment to investment that would have significantly positive effects on productivity.³⁵ It advocated for keeping investment orientation in line with the debt rule and suggested an asset-oriented interpretation of the “golden rule”. According to this, depreciation should be deducted and investment earnings, i.e. revenues from privatisation or similar transactions as well as loan repayments should be offset.

On the other hand, the Scientific Advisory Council at the Federal Ministry of Finance assigned more weight to the problems of defining the notion of investment.³⁶ Furthermore, it adjudged productivity effects on other state expenditures that did not fall under the concept of investment as set out by the Federal Budget Code, meaning that in general a certain part of the debt should be allowed.³⁷

Finally, the Advisory Forum argued in favour of a narrow debt limit for federal and Länder governments in light of the demographic change. The result was the introduction of a new debt brake in 2009 that was no longer oriented towards the “golden rule”.

The German debt brake and the fiscal pact

The German debt brake is characterised by the following key points.³⁸ It sets the course for the Federal Government to achieve a virtually balanced (structurally) budget starting in 2016 with a maximum allowed deficit of 0.35 per cent of the gross domestic product (GDP) and makes no provision for investment orientation anymore. A transitional regulation is to apply up to that year. Cyclical adjustment is being carried out using a process that is transparent at least to the specialised public. The basic idea is that the Federal Government can borrow more during a recession. There are furthermore exceptions for particularly severe recessions, natural disasters or shocks that are beyond the control of the legislature. Budget planning and implementation are linked together by a control account. Financial transactions will be deducted in accordance with European legal guidelines. New special funds will continue to be allowed, but they are subject to the debt brake. Article 115 (2) of the Basic Law (old version) is to be deleted without replacement. Existing special funds will be continued in accordance with their own legal basis and are to be partially outfitted with repayment plans.

The Länder will be subject to the debt brake starting in the year 2020. From then on they must be able to submit (structurally) balanced budgets. The original proposal by the Federal Government to split a financing gap of 0.5 per cent of GDP between the Federal Government (0.35 percentage points) and Länder governments (0.15 percentage points) was rejected by the Länder. The majority of the Länder have by now already adopted their own debt brake policies, although there are significant differences among them. The Federal Government also pays consolidation assistance to financially weak states. A Stability Council made up of

35 Sachverständigenrat zur Begutachtung der Gesamtwirtschaftlichen Entwicklung (2007), p. 49 pp. and subsection 123 pp., p. 76. For the productivity effects of public investment see Romp and de Haan (2007).

36 As far back as 1980, the Scientific Advisory Council of the Federal Ministry of Finance (1980) alluded to enormous demarcation problems and advocated a narrow version of the concept of investment.

37 Cf Scientific Advisory Council at the Federal Ministry of Finance (2007).

38 Cf Feld (2010) and Kastrop et al. (2010).

federal and Länder ministers of finance as well as the Federal Minister for Economic Affairs, is monitoring the consolidation agreements concluded with these Länder.

The German debt brake is therefore largely based on the Swiss debt brake. It is being adapted to fit in with the European legal framework and with special features particular to Germany, especially the German form of cooperative federalism. Both of the debt brakes are based on the philosophy that the State should be allowed to accrue debt within a specific framework. However there should be no prioritisation with regard to the structure of expenditures. Public investment is therefore not granted any favouritism with respect to government consumption of the transfer of state resources.

The fiscal pact raised the debt brake up to the European level, but it entailed modifications to German law. The fiscal pact debt barrier set at 0.5 per cent of GDP appears to be greater at first glance, but alongside the federal and state authorities it includes the local authorities and social security system in this debt limit. Depending on their financial situation, the framework of 0.5 per cent can therefore be widened or narrowed. Moreover, the fiscal pact requires the establishment of an independent advisory board to the Stability Council in order to comply with the independence requirement for the national fiscal councils. Finally, the demarcation of the state set out in the fiscal pact in accordance with the national accounts (VGR), which has commonly been used in European guidelines since the Treaty of Maastricht, plays a role for example in the consideration of public-private partnerships (PPPs). If the financing risk for a PPP project lies primarily with the state, the PPP will be apportioned to the public sector and is therefore subject to the fiscal pact. In practice, PPPs are apportioned to the state because so far the Federal Statistical Office has had no way to concretely assign the risks to the individual projects.

Recommendations for action: Possibilities to strengthen public investment within the framework of the debt brake

The basic philosophy of the debt brake relies on policy-makers setting the right priorities for the structure of government spending. As described above, this presumption does not always have to be correct in light of legal and political bias. Therefore, in principle, the reintroduction of an investment orientation as a supplement to the new debt regulation could be considered. However, the experience with the old debt regulation shows that such an attempt would have to go beyond the old investment orientation in order to be effective – in the form of a minimum investment ratio. In light of the problems in defining investment, such a requirement is not only impractical, but much too rigid as well. Important areas of state responsibility, which can also be seen as advance concessions on private investment – education, healthcare, public safety and justice, defence and even social security spending and other transfers of state resources – would possibly be neglected. Rigid regulation at the constitutional level would deny the possibility for policy-makers to recognise and set these priorities.

This does not mean that the German Government would have no possibility to increase the commitment to the benefit of investment in infrastructure. The Expert Commission considers essentially two approaches to be possible: legal guidelines below the constitutional level – for example, at the level of financial regulations – and the creation of specialised institutions that are dedicated to investment in infrastructure and have access to sufficient revenues to comply with this mandate regardless of the annual budgetary process.

Budgetary solutions. A stronger investment orientation of government activity that is laid down in law, which would be compatible with (the philosophy of) the debt brake, could be achieved through the budgetary law. Currently the local authorities are changing from old government budget management, i.e. simple bookkeeping with revenue and expenditure accounting, to double-entry bookkeeping. In most Länder, this process has already been completed. Only four Länder so far, namely Bremen, Hamburg, Hesse and North Rhine-Westphalia, have decided to make this transition.⁴⁰ In accordance with double-entry accounting,

40 Currently in the implementation process (EPOS).

all assets (fixed and current assets) are juxtaposed against all debts (liabilities and provisions) on the balance sheets of the central management of the regional authorities. Thereby it is necessary to carry out periodic depreciation on fixed assets. This depreciation offers a starting point to ensure the preservation of public infrastructure through maintenance investments. For example, an annual re-investment in the amount of depreciation could be codified in budget law in the appropriate manner. As a result, the relevant regional authorities would be liable for government investment to a limited extent. Such a legal requirement could be stipulated by Länder law for the municipalities.

The question is whether a similar approach could be applied at the Federal level. Within the framework of the project European Public Sector Accounting Standards (EPSAS), the European Commission and Eurostat are aiming to introduce uniform (double entry) accounting standards for the public regional authorities. So far, however, no agreements with the member Länder have been made. At the same time, the Federal Government and the large majority of the Länder do not want to switch over to this accounting system.

A possible, albeit imperfect alternative or supplement to the investment rule relating to double-entry depreciation could be a budgetary commitment at the Federal level, according to which unexpectedly emerging budgetary margins (“positive surprises”) must have priority to be used for increased public investment.

Such a rule would have a number of advantages. One important advantage of such a rule would be that one of the causes for too little investment – namely investment deficits due to unexpectedly low revenue or high expenditures lead to investment deficits because reductions can be made more flexibly in this expenditure category – would be compensated for by a symmetrical rule. This rule would be consistent with the existing debt brake, which it would complement in a useful manner. One potential drawback of such a rule is that higher investment might not necessarily be desirable every year, and thus such a rule, at least in the short term, could promote excessively high public investment in some cases. A practical elaboration of such a rule could, however, account for this and make the requirement for higher public investment dependent on the amount of the existing investment ratio. The introduction of such a rule would nevertheless help to at least slow the long-term trend of the shrinking investment ratio, or even to turn it around.

Funding from institutions with an investment mandate.

Another way to achieve constructive commitment from the state is to establish institutions that are responsible for new investments and (most importantly) maintenance in certain categories of infrastructure, and to give these institutions funding that is not reversible, or which is very difficult to reverse in the short-term. One example of this is a public infrastructure company (or several such companies) owned by the Federal and Länder governments that is responsible for financing, construction and maintenance of transport infrastructure and is independently financed regardless of the Federal budget through a transfer of toll revenue (see section 3.B). Another alternative could be increasing the capital of a development bank (or capitalisation of a fund) in order to provide additional equity financing for infrastructure (see section 3.C)

In summary, the following can be established: In accordance with the debt brake, financial regulations or new institutions should be used to give the state the necessary impetus to provide sufficient investment – particularly in the area of maintenance. Both are possible in full compliance with the debt brake.

3. Provision of public infrastructure

3.A. Ways of strengthening municipal infrastructure

The backlog in investment at the municipal level documented in chapter 1 can be attributed to three possible causes. First of all, a great need for investment especially in cities and communities experiencing strong population growth, but also in the western German states as a result of the end of life cycles for new buildings and infrastructures built in the late 1960s and 1970s. Secondly, relatively low expenditures on investment due to a scarcity of local community resources and considerable pressure on expenditures in other categories (social expenditures). Thirdly, there is a need to improve the efficiency of investment expenditures. Thus, for example, alternative types of projects and/or procurement models are not often enough compared in terms of their efficiency, while planned construction costs and times are often exceeded and maintenance neglected.

These problems are first of all discussed briefly in the following chapter. After this there is a cursory presentation of the debate on the advantages and disadvantages of public-private partnerships (PPPs) in comparison to conventional execution (by public authorities themselves).⁴¹ It is not possible to perform a well-founded comparison of the strengths and weaknesses of PPPs with conventional procurement models within the framework of this report, however.⁴² The Expert Commission for this reason does not comment on the question as to whether Germany should procure more or less by means of PPPs. Instead, it calls for (1) a neutral, well-founded examination of efficiency independently of the procurement model selected for each investment in infrastructure beginning at a certain minimum level – for example, EUR 5 million, and (2) for PPPs to be planned and executed in a manner which protects local community interests.

The remainder of the chapter is developed on the basis of these recommendations for action. These recommendations are aimed at both an increase in public funding that is made available for municipal investment as well as a boost in the efficiency of its use. This includes institutional solutions supporting municipalities in project development, reviews of efficiency and project management, the reduction of financing and transaction costs associated with PPPs, and the review of additional procurement models in which public enterprises and community collaboration stands at the forefront.

Analysis of the problem

a. Scarcity of municipal resources

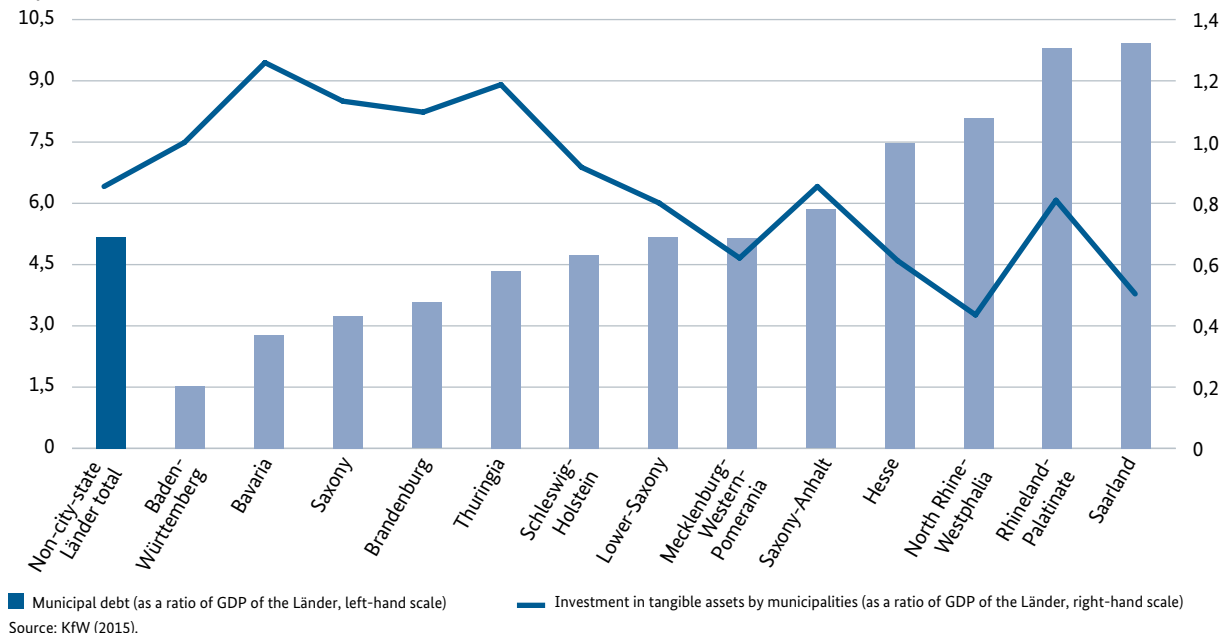
One significant underlying cause for the sagging trend in municipal investment is the financial situation of many cities and municipalities.⁴³ The reasons for this include rising social expenditures, declining revenue and/or demographic changes. This leads to lower investments in material and higher levels of municipal debt (Figure 3 1). High levels of indebtedness once again puts many municipalities in a position where they can scarcely take advantage of prevailing low interest rates at present to boost their investments because the financial resources required are not available and long-term investment projects will not be approved by the supervisory authorities in charge at the local level. In a situation like this, many projects for the construction and/or operation of infrastructure are not even planned in the first place, or maintenance of such is frequently neglected. This raises the costs of operation for an outmoded infrastructure.

41 The following terminology is used in this chapter: “procurement by public authorities themselves” (or, synonymous with this: “conventional procurement”) means that the municipality finances itself (by taking out loans, bonds, or by using its own resources) and generally also operates projects and infrastructure itself. When authorities perform procurement themselves, building services are usually procured in partial lots. “Performance by other parties” means that the planning, building, operation and frequently (pre-) financing of a local project is rendered by an enterprise or consortium. Performance by private enterprises is often referred to as public-private partnerships (PPPs), at least to the extent that the project stages of planning, building and operation (and possibly financing) are rendered by (private) parties. Generally speaking, performance by other parties can also be rendered by (private) parties. Usually, however, performance by other parties could also be rendered by public (including a municipality’s own) enterprises or other public institutions.

42 Instead, see the following literature: Beckers und Klatt (2008), Weber und Alfen (2009), Präsidentinnen und Präsidenten der Rechnungshöfe des Bundes und der Länder (2011); World Bank (2014); Engel et al. (2014).

43 Deutscher Städtetag (2014), Gemeindefinanzbericht 2014.

Figure 3-1: Level of debt and investment in tangible assets by municipalities broken down by Länder, 2013
in per cent



b. Efficiency problems

Lack of studies on efficiency and erroneous studies of efficiency. The selection of infrastructural investment is primarily orientated towards the need for infrastructural facilities at the local level (requirements planning). A study of efficiency is only provided for in a second decision in connection the procurement. Even though the fundamental principles of budgetary law stipulate that appropriate studies of efficiency are to be carried out for all measures having an impact on public finances, studies of efficiency are only required beginning at a certain level of magnitude for municipal investment in most of the German non-city-state Länder. The reasons for this are the lack of financial resources, but also manpower constraints in many municipalities. In particular smaller communities lack the capacity to adequately compare alternative investment and procurement options.

There are moreover no uniform standards with regard to the method to be used aside from procurement through PPPs.⁴⁴ A survey has shown that appropriate risk analyses are carried out in less than one-fifth of conventionally executed investment projects at the local level.⁴⁵ A current survey conducted by the Federal Ministry for Economic

Affairs with 1,017 persons in charge of finance at the local level throughout Germany has shown that only 6 per cent of municipalities “always” carry out a detailed analysis of efficiency and 33 per cent “generally” perform such assessments.

When studies of efficiency are performed, only one in every three municipalities comprehensively examines projects over their life cycle. Project risks are by the same token only examined in a comprehensive manner in 5 per cent of local communities. Only 19 per cent of the persons surveyed very frequently make the final investment decision after comparing studies of efficiency for different options (continued operation without fundamental investment, refurbishment, construction of new building, leasing of space).

Cost overruns. The survey conducted by the Federal Ministry for Economic Affairs also demonstrates that cost and time overruns constitute a frequent problem in the execution of projects. 47 per cent of the municipalities surveyed stated, for instance, that the costs of infrastructural projects that they carried out themselves were generally “worse than planned”, with 5 per cent even stating that they were “much worse than planned”. A question about adherence to deadlines produced similar answers.

44 Guidelines “Wirtschaftlichkeitsuntersuchung bei PPP-Projekten” commissioned by FMK 2007.

45 Hesse et al. (2013).

Distortion of the structure of expenditures to the detriment of maintenance and repair. There are reasons to believe that investment in maintenance and repair is disproportionately low in comparison to new investment. In order to save on costs over the medium term it often makes good sense to invest a greater portion of infrastructural expenditures in maintenance and repair even if this is at the expense of new investment. Bottlenecks in ongoing maintenance and repair, for instance, frequently lead to temporary measures being taken, without actually staving off premature deterioration in the condition of existing buildings.⁴⁶

The PPP debate

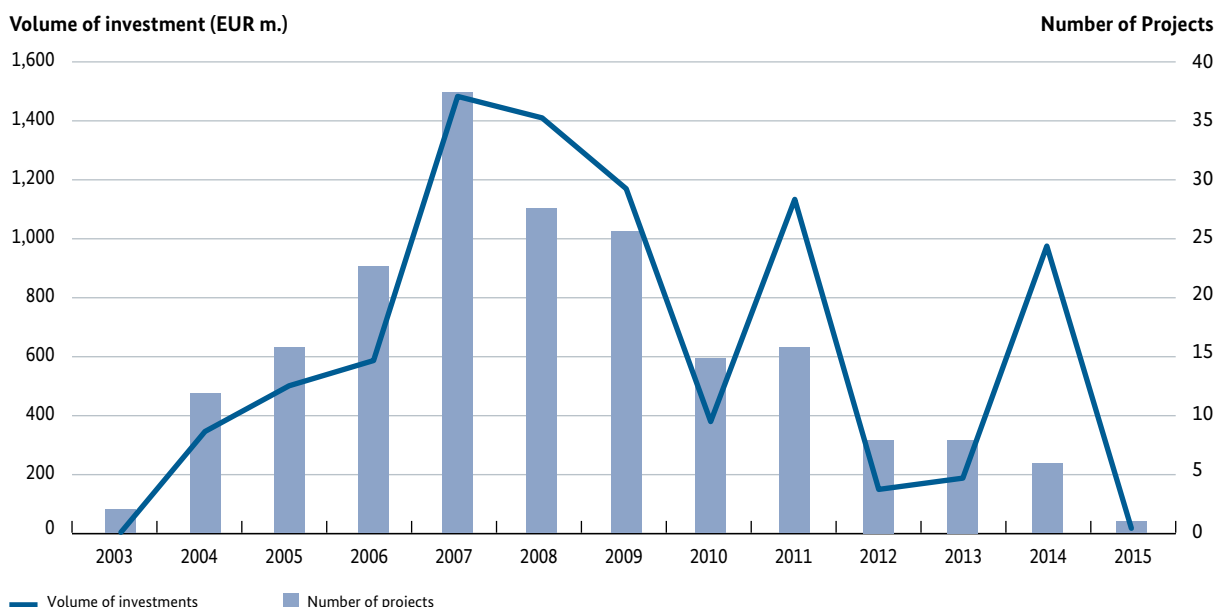
PPPs are relatively rare in Germany. There have been 140 PPPs in Germany since 2002 with an investment volume of approximately EUR 3.1 billion in German municipalities. This is only 1.3 per cent of total municipal investment in construction over the same period of time (EUR 239 bil-

lion). In international comparison as well, PPPs in Germany only plays a subordinate role.⁴⁷ The number of projects completed over the last few years is furthermore declining (Figure 3 2).

Almost 50 per cent of PPPs at the municipal level were devoted to education (schools and child-care), 30 per cent to the sectors of sports and leisure time and 10 per cent to administrative buildings. No major PPPs are known to exist in the area municipal road construction.

Because private financing and the provision of public infrastructure is ultimately paid for with public funds⁴⁸ PPP is not a panacea for the fiscal problems plaguing municipalities. The approval of PPP by supervisory offices at the local level in highly indebted communities therefore generally also takes place in accordance with the long-term financial capabilities of municipalities and hence according to the same criteria as approval of investment financed by taking on debt.

**Figure 3-2: Development of the PPP market in Germany (CoA = conclusion of agreement)*
Projects with VAS, civil engineering and road-building, 2003-2014**



*Total: EUR 8.5 b.; civil engineering: EUR 5.7 b.; roads: EUR 2.8 b. (17)
Source: Partnerschaften Deutschland (2015), see analysis

46 Cf Engel et al. (2014) and the North Rhine-Westphalia Ministry of Finance (2014).

47 EPEC (2014).

48 User fees are only common at the municipal level in a few sectors such as sports and leisure time.

PPPs could contribute to closing the investment gap if they raised the efficiency of infrastructural projects and reduced the fiscal risks associated with them. Thus the following **advantages** of PPPs over conventionally executed projects are cited:⁴⁹

- In spite of perhaps greater financing costs, PPPs can ultimately be lower-cost than projects carried out by municipalities on their own because planning, construction and operation are performed by one set of hands more efficiently in the guise of specialised companies.
- The contract structures associated with PPP may offer stronger incentives to avoid cost or time overruns by projects than in the case of projects carried out by municipalities themselves. Thus, the survey by the Federal Ministry for Economic Affairs cited above shows that only 15 per cent of municipalities with PPP experience evaluate adherence by PPP projects to planned building costs as “poor” or “very poor”. By comparison, 52 per cent of the same municipalities stated that the building costs of conventional projects were in general poor or much poorer than planned. Similar answers were produced by a question on how often deadlines were met.
- PPPs could secure adequate maintenance better than cases in which municipalities perform projects by themselves because contractors are often obligated to return the investment in a condition whose quality is stipulated by contractual agreement following the operating phase. This can increase the lifetime of infrastructure, as a result saving on costs over the long term.
- Transfer of risk to private parties: if the project goes awry or it becomes more expensive than planned, the contractor generally has to shoulder the losses, not the public principal. This could help especially communities that are fiscally weak, that face tight financial constraints and have limited latitude to take on debt.
- The significant burden posed to public principals by investments at particular points in time (for instance, because a large amount of refurbishment and investment in replacement has to be made) can be spread out over time through PPPs. This could also be the case even when a public principal has ready access to the

credit market because projects carried out by municipalities themselves are generally subject to more demanding human resource and administrative requirements applying to a principal than outsourced projects.

Criticism of PPPs can be grouped into three categories:

- The possible advantages of PPPs may be outweighed by high costs. These include the generally higher financing costs incurred by private actors, but also the costs of tedious contractual negotiations and risk assessments. On top of this, one of the key features of PPPs – long-term binding of the contractor by contractual agreement through the lifecycle of the project, which is intended to ensure efficient planning, construction and operation – may also pose problems from the perspective of a public principal. Over such a long period of time unexpected developments frequently crop up that can bring about a need for adjustments. Private investors and operators are interested in planning security, however, and hence in concluding contractual agreements that restrict subsequent adjustments. Subsequent adjustments are therefore only possible to a limited extent in the case of PPPs, or are associated with considerable costs.
- Critics of PPPs moreover point out that many or perhaps all advantages of PPPs can also be obtained within the framework of conventional procurement models by means of a suitable contractual design with building and operating companies. The positive “self-binding” effect of PPPs with respect to maintenance and repairs could generally be attained by alternative mechanisms in connection with commercial procurement.
- Finally, PPPs do not always deliver what they promise. In particular, the transfer of risk to private parties may be insufficient or prone to mistakes in the case of PPPs. If PPP contracts are not well negotiated, or if the salience of a certain risk is so great that it cannot be assumed by the private contractor, the risk must then be assumed once again by the public sector in whole or in part. The first two generations of PPP projects in Germany, for instance, were characterised by considerable systemic mistakes that public principals had to bear the consequences of.

49 Cf. e.g., Engel et al. (2014).

In the eyes of critics, these mistakes were inter alia due to PPP projects often not being truly motivated by an interest in transferring risk or greater efficiency, instead being opted for by municipalities as stop-gap solutions in times of (excessively) constrained public budgets. This interpretation is supported by a report from Federal and Länder auditing offices, according to which the efficiency of conventional procurement was downplayed in comparison with the PPP variant in most of the PPP projects examined by the auditing offices. The report attributes this to (a) some public principals preferring PPPs because they conceal fiscal burdens; (b) consultants having an interest in decisions to use PPPs, and therefore exaggerate the risks of conventional procurement.⁵⁰

There are negative examples for conventionally performed projects, however. The question is how representative poor experience with both models is, and whether such can be avoided. There is a lively debate over this question as well. There is merely general agreement that there are successes and failures in the case of both PPPs as well as conventional procurement, and that this depends on the quality of the efficiency study at the outset, the planning and execution of the project.

Recommendations for action

In view of the analysis of the problem described above, the Expert Commission bases the strategy it recommends for strengthening local community investment on three pillars.

First of all, the **expansion of financial latitude** that is available to municipalities for investment. To this end a “**national investment pact for municipalities**” (NIK) is being sought that with the support of Federal and Länder resources will make possible an expansion of investment activities in an amount commensurate with the estimated wear and tear on existing buildings and infrastructure over the last three years (at least EUR 15 billion), while at the same time devising long-term strategies for solutions to better foster investment by municipalities.

Secondly, **strengthening of municipal capacities** so that they can plan and execute projects as efficiently as possible. To ensure this, municipalities must be provided with

appropriate human resources. In addition, it is proposed to establish one (or more) “**infrastructure enterprises for municipalities**” (**Infrastrukturgesellschaft für Kommunen – IfK**), or several regional infrastructure enterprises to help municipalities determine the most economical project and procurement variant on the one hand, while supporting the realisation of investment projects – regardless of whether these be conventional or PPPs – on the other.

Thirdly, the review and possible development of “**public collaboration**” (**Öffentliche Kooperationen – ÖfK**) in which public corporations and inter-community collaboration stands at the forefront. These could offer a useful alternative to, or supplement existing, varieties of procurement. As in the case of other procurement variants, a study of efficiency should also take place here before a local community decides in favour of one form or the other.

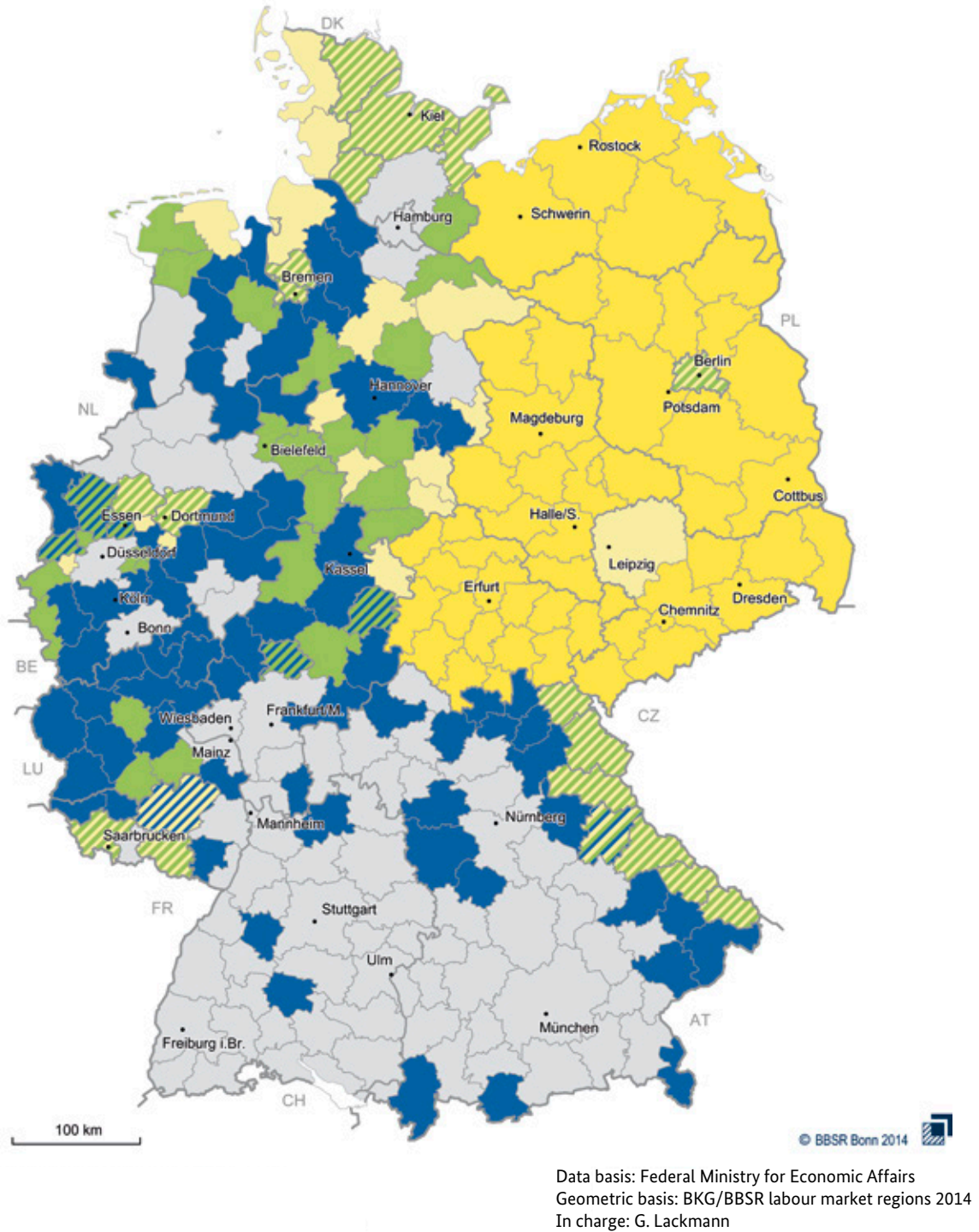
a. A national investment pact for municipalities












Many German municipalities lack the public financial resources to carry out required investment in infrastructure. This not only applies to “structurally weak” communities in the traditional meaning of the word, but also municipalities that are growing rapidly or which have to replace a generation of crumbling infrastructure within a period of a few years. The aforementioned measures should therefore be reinforced by direct subsidisation of investment by the Federal and Länder governments to strengthen investment in such municipalities in a sustainable manner. To achieve a sufficient impact, an expansion of publically financed investment activity by municipalities at a level of at least EUR 15 billion should be targeted over the period 2016-2018. This approximately corresponds to the depreciation of the existing stock of infrastructure over the last three years.

The measures adopted and planned by the Federal Government in the first third of the legislative period to provide relief and enable a targeted strengthening of investment at the municipal level is an important initial step in this: thus the Expert Commission in particular welcomes the financial package to benefit municipalities announced a few weeks ago by the Federal Government and in particular its suitability for investment. In addition to additional relief for social expenditures and the allocation of additional

50 Presidents of the auditing offices of the Federal Government and the Länder (2011). A contrary position is contained in Stellungnahme der Länderarbeitsgruppe zu dem Bericht der Präsidentinnen und Präsidenten der Rechnungshöfe des Bundes und der Länder, http://www.ppp.nrw.de/oeffentlichkeitsarbeit/veroeffentlichungen/stellungnahme_brh-bericht_anlage.pdf

Figure 3-3: Promotional areas as the joint task of “improving the regional economic structure” over the period 2014 -2020 (60% funds) in demarcation to labour market regions



- | | | |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
|  Predefined C promotional area |  In part not predefined C, par part E promotional area |  border labour market region |
|  Non-predefined C promotional area |  In part D, in part E promotional area |  border Federal Länder |
|  D promotional area |  In part not predefined C, in part D, in part E promotional area | |
|  E promotional area |  Non-promotional area | |
|  In part not predefined C, in part D promotional area | | |

Source: BBSR Bonn (2014).

portions of value-added tax in an amount totalling EUR 2.5 billion, this also includes the creation of a special fund to promote investment amounting to EUR 3.5 billion. This special fund is to be used in a targeted manner for investment in financially weak municipalities over the period 2015-2018. According to the basic underlying principle, only those areas can be subsidised in which the Federal Government has legislative jurisdiction. Under this measure, the areas receiving support would be limited to hospitals, noise protection along roads, information technology (restricted to rural areas with the aim of achieving the expansion target of 50 Mbit), energy-oriented refurbishment of schools and continuing education facilities, facilities to care for young children and climate protection.

Local communities have an even greater need for financial support, however. A sustainable reduction in financing constraints on municipalities moreover requires not only a temporary injection, but rather permanently greater financial resources for municipalities that can be applied flexibly. The special fund of EUR 3.5 billion should therefore be supplemented with a second support instrument that is not limited in time and which can be used more flexibly – for instance for maintenance and repair, expansion or modernisation of municipal transport routes.

The point of departure could by the same token be the already-existing joint Federal-Länder task of “improving the regional economic structure” (GRW). This instrument could be refined and further developed. At present the action latitude of the GRW covers approximately 40 per cent of the total German population in so-called C and D promotional areas. By expanding the range of areas receiving support to include additional “E areas”, investment activity could also be stimulated in additional municipalities. The determination of the E area should be orientated towards the existing GRW ranking of weak structure (based on a regional indicator model with labour market, income and infrastructure indicators) and could be calibrated in such a manner so that a larger number of municipalities could be categorised as eligible for support in the future than has been the case to date (see for example Figure 3-3, with promotional territory coverage of 60 per cent of the population).

In order to avoid entering into competition with classic regional structural policy, promotion in E areas should be limited to the area of infrastructure. At the same time, the currently existing restriction of support to narrowly delineated categories of infrastructure should be eliminated so that municipalities would have sufficient freedom to decide how to use the resources themselves.⁵¹

The eligibility of a project for support would largely depend on its efficiency – i.e. needs at the local level in relation to the costs of the project. The portion which municipalities have to assume themselves should be adjusted to the regional structural weakness of municipalities (C, D or E area) and be contingent upon the existence of spillover effects (e.g. to additional municipalities or at the supra-regional level). The 50-50 matching co-financing provided by the Länder laid down in Art. 91a of the Basic Law could be adjusted within the course of the ongoing debate over the reform of the Federal-Länder financial relationship and the further development of the support system for structurally weak regions.

The proposed expansion of tasks of the GRW requires review in terms of constitutional law and law governing state aid.

b. Strengthening local community capacities and reviewing the establishment of infrastructure enterprises for municipalities

Local communities must have sufficient capacities to be able to plan and carry out projects as economically as possible. This specifically involves the attainment of three paramount objectives:

- **Selection of the most efficient project and procurement variants.** This requires a well-founded study of efficiency that is not influenced by any interests comparing the costs and benefits of alternative variants over the lifecycle of a project and that realistically assesses the risks. Regardless of the procurement model, such studies should be obligatory and carried out with neutral methods for all public investment projects beginning with a certain magnitude. Any deviations from

51 At present, among other things the construction and expansion of industrial and commercial land, communications connections (broadband), vocational education facilities, commercial centres and tourist facilities are receiving support. School-building and local road construction are not eligible for promotion at present. The constitutional-law implications of an expansion in the list of areas receiving support would have to be reviewed. Support for municipal road construction should be in conformity with the Constitution, as it serves to improve the regional economic structure (Art. 91a of the Basic Law). Support for the construction of schools would probably require an amendment to the Constitution, however.

assumed cost frameworks over the course of the execution of the project should be reviewed and rendered transparent – no matter whether projects are of a conventional nature or executed by means of PPPs.

- **Professional planning and management of projects municipalities carry out by themselves.** With the aim of avoiding frequently made mistakes – like cost overruns and insufficient inclusion of resources for maintenance and repair in planning.
- **Reduction in costs and risks associated with PPPs.** Both transaction and financing costs of PPPs should be kept as low as possible. This includes risks only being assumed by the contractor if it can shoulder these better than the local community itself, such as for example building or operational risk. In contrast to this, it is not worthwhile to pay for the transfer of risks which the local community is better informed about than the contractor, or risks which the local community can influence.

Cities and municipalities need to have the human resources available to be able to afford this. If this is not the case (or no longer the case), sufficient capacities need to be (re-) established in order to be able to carry out preliminary planning, perform the function of builder and steer the project at ground level.

On top of this, the creation of a public **infrastructure enterprise for municipalities** (IEC) should be reviewed (or possibly several such enterprises), which would stand behind municipalities as affordable consultants with expertise but not tied to any parochial interests. The aim could be to support municipalities throughout the complete project cycle: in determining needs and conducting efficiency studies, in tenders and negotiations with contractors, and possibly as project managers. The contracting and governance of IECs would have to be designed in a manner so that the IECs would be operated in a strictly neutral manner compared to alternative procurement models and also be perceived in this way. The specialised know-how of IECs could help reduce costs involved in negotiations and better represent the interests of municipalities vis-à-vis contractors. The IECs could furthermore identify similar projects - that are scattered in geographic terms, however - which would be suited for coordinated or pooled project execution. This could help promote cooper-

ation between municipalities, leverage economies of scale and reduce financing costs for these projects.

Existing infrastructure enterprises such as DEGES or VifG should be evaluated in order to determine whether it would make sense to establish infrastructure enterprises at the national and/or Länder level, and how such enterprises should then be designed. Experience gained in public administration of contracts (Länder and municipalities) should be taken into account while examining how cooperation between the enterprise (or the enterprises) and administrations in charge of contractual agreements can most effectively be designed.

c. Review and further develop "public cooperation"

One alternative both to municipalities performing projects on their own as well as PPPs are procurement models in which collaboration between public enterprises as well as inter-community collaboration stand at the forefront. Just like in the case of PPPs, planning, the execution, operation and possible financing of projects is performed outside the local core administration and within the framework of a lifecycle perspective. The contractor is a public enterprise, however, that on the one hand has to secure its economic viability, but on the other pursues the public interest.

Collaborative ventures are already taking place at present between larger municipalities and communities' own building and operating enterprises.⁵² There are moreover residential construction enterprises at the inter-community and Länder levels that offer planning, building and operating services (for example, construction of new buildings or refurbishing of schools or administrative buildings) directly themselves or via subsidiaries.

Compared with conventional execution of projects by municipalities themselves, this procurement variant offers advantages in efficiency through specialisation, scales of economy in the servicing of infrastructures, and the resolute implementation of the lifecycle approach. In addition, these create natural strategies for coping with common problems and interests of several municipalities – for example, when public construction or operating companies are funded by several municipalities and operate at the regional or even Länder levels.

52 This is usually a three-phase model, i.e. it does not include financing; one example is the city of Nuremberg.

This model can offer municipalities advantages in some aspects, including in comparison to typical PPP models. In addition to the element of inter-community collaboration, these include greater trust and confidence as a result of common interests. Flexibility may moreover also be greater when contractual agreements have to be amended or changed, thus lowering possible costs associated with such. Additional advantages over the PPP model could arise through the simpler earmarking of subsidies. These need to be compared with other advantages offered by PPP models already discussed in the foregoing.

Public cooperative ventures are not without risk, however: if a public enterprise accepts compromises when pressured by a principal (especially when this principal is the majority shareholder), this could jeopardise economic sustainability over the long term. In order to contain this problem and take advantage of economies of scale as well as inter-community cooperation possibilities, public cooperation therefore seems to be the most attractive alternative when such is financed by several communities.

Little is known about the success of this model at the present. Public cooperation should therefore be evaluated and possibly refined and further developed. Procurement variants of this type should moreover be subject to the same discipline as other variants: they should only be opted for if they emerge as the winners from neutral studies of efficiency.

3.B. Traffic infrastructure at the Federal level

Mobility is a key precondition for the competitiveness of an economy. This applies both to transport of persons as well as freight traffic. The German traffic system is considered to be well developed by international comparison, with traffic volumes being accordingly very high in Germany. Around 1,141 billion passenger kilometres were travelled on German roads, rails, waterways and in the air in 2013. 645 million tonnage kilometres were transported in domestic freight traffic.⁵³ Even if efforts have been made for some time to relieve the strain on roads, these are and remain of paramount importance both to freight traffic and passenger transport: approximately 80 per cent of passenger traffic and 70 per cent of freight traffic takes place

on roads. Of this amount, around half is accounted for by long-distance transport, which for the most part takes place on federal roads and motorways. These bear a particular burden: around two-thirds of freight traffic takes place on one-fourth of the roads.

Against this background, the maintenance and expansion in particular of supra-regional federal trunk roads is of key importance to the function and efficiency of the German traffic system. Around half of the annual backlogged need for investment in the supra-regional road network estimated by the Daehre Commission is thus accounted for by the Federal transport infrastructure.⁵⁴ The Expert Commission recognises the special importance of federal trunk roads to mobility and has therefore resolved to limit its recommendation for greater investment in traffic infrastructure at the Federal level to these.

Current situation

Legal foundations

The German Constitution stipulates that the Federal Government is the owner of Federal motorways and federal roads in Art. 90 (1) of the Basic Law. Under Art. 90 (2) of the Basic Law, the Länder are to administrate federal trunk roads upon the commission of the Federal Government (devolved administration). Under Art. 104a (2) of the Basic Law, funding of expenditures is assigned to the Federal Government. It has to bear the expenditures emanating from the activities of the Länder in administering the task assigned to them. As a result, performance of the task (Länder) and responsibility for expenditures (Federal Government) differ. Additional arrangements of crucial importance to the construction and operation of federal trunk roads (Federal motorways and federal roads) are laid down in the Federal Highways Act (Bundesfernstraßengesetz – FStrG). This lays down that the Federal Government is the institution responsible for the expenses of road construction (all tasks relating to the building and maintenance of federal trunk roads). By way of deviation, communities with more than 80,000 inhabitants are the institutions responsible for construction expenses in connection with their local transit roads for federal roads. With regard to the current stock of federal roads (39,389 km as of 1 January 2014), the Federal Government is therefore responsible

⁵³ Cf DIW Berlin (2014).

⁵⁴ Cf the Report by the Daehre Commission, p. 37.

for 37,613 km of construction costs, while larger municipalities are responsible for about 1,760 km.

The planning and determination of federal trunk roads routes is in the charge of the Federal Ministry of Transport in concert with the Länder planning authorities that take part in such (§ 16 of the Federal Trunk Roads Act – FStrG). The foundation for this is the requirements planning by the Federal Government, which contains the conception for the further design of the federal trunk road network. The planning of needs is based on the Plan for Federal Traffic Routes, which comprises the infrastructural planning for all Federal transport routes. As a result of its political importance, the requirements plan is adopted by the German Bundestag as an annex to the Federal Trunk Roads Expansion Act (Fernstraßenausbaugesetz). On the basis of requirements plans, the Federal Ministry of Transport and Digital Infrastructure submits five-year plans indicating investment needs for the next few years. It was to this end that the Federal Ministry of Transport developed an investment framework plan for the traffic infrastructure of the Federal Government covering multiple modes of transport (IRP) for the first time in 2006/2007.⁵⁵

Under § 17 of the Federal Trunk Roads Act (FStrG), federal trunk roads may only be planned or altered following the issue of planning permission. By the same token, public and private interests affected by plans including environmental compatibility are to be taken into account in the consideration of the various interests. § 72 to § 78 of the Administrative Procedures Act (Verwaltungsverfahrensgesetz) apply to the planning permission procedure.

Construction, project management and operation

The project backers for the construction of federal trunk roads are the road-building administrations of the Länder, which have very different powers and responsibilities, however. The Länder authorities are subject to the instructions of the Federal Ministry of Transport under Art. 85 (3) of the Basic Law. Technical supervision by the Federal Ministry of Transport under Art. 85 (4) of the Basic Law ranges to include not only conformity with the law, but also the expedience of execution. To this end the Federal Government can require reporting and the submission of files and send commissioners to all authorities. The Länder are also

in charge of operational services for roads (controls, maintenance including minor repairs and upkeep, i.e. services that are necessary to meet requirements and ensure safe usage as well as preservation of functional condition of roads and their elements). More than EUR 1.1 billion (2012) is expended by the Federal Government each year on operational services for federal trunk roads.

In the wake of German unity, planning and execution of building was assigned to DEGES (Deutsche Einheit Fernstraßenplanungs- und -bau GmbH) to ensure rapid implementation of the German Unity Traffic Project in the new German Länder. DEGES steers building measures upon the respective commission of the Länder involved. Founding partners are the Federal Government and the five new German Länder. The western German Länder entered the DEGES as partners last year, when its tasks were expanded.

Financing

Federal trunk roads are traditionally financed by funds from the Federal budget in Germany. Thus expenditures by the Federal Government for federal trunk roads in 2013 amounted to EUR 7.6 billion. Of this amount, EUR 5.4 billion was used for investment (EUR 3.3 billion for Federal motorways and EUR 2.1 billion for federal roads).

Practice to date in Germany of involving private investors in the provision and financing of traffic infrastructure has taken place through project-related public-private partnerships (PPPs). This involves A, F or V models that have been put on the market by the Federal Ministry of Transport in cooperation with the Länder. More than EUR 3 billion in private capital has been invested in projects awarded to date.⁵⁶ Challenges, opportunities and problems faced by PPPs were discussed in the preceding chapter and in principle also apply to the traffic and transport infrastructure of the Federal Government.

At the same time, road traffic produces government revenue from several sources. Almost EUR 46 billion was generated for the Federal budget in 2013: EUR 8.5 billion from the motor vehicle tax, EUR 32.9 billion from the energy tax (formerly the mineral oil tax) and EUR 4.4 billion from the motorway toll on commercial vehicles with an allowed total weight beginning at 12 tonnes (lorry toll), which has been imposed since 2003. While revenue from the lorry toll

55 Cf BMVBS, Investitionsrahmenplan 2011 – 2015 für die Verkehrsinfrastruktur des Bundes (IRP), 2012.

56 Cf the lecture by the Managing Director of VIFG, Prof. Torsten R. Böger, at the 3rd meeting of the Expert Commission on “Strengthening investment in Germany”, in Berlin on 17 November 2014.

is earmarked for investment in traffic infrastructure (in the modes of transport rail, road and waterways until 2011, only for federal trunk roads beginning in 2011), revenue from the motor vehicle and energy tax can generally be used as tax revenue for expenditures of all kinds (the “principle of non-effectiveness”). There are formal earmarkings for road-building and public local mass urban transportation that have evolved historically for portions of the revenue from the mineral oil tax, however (which has varied over time) (Act on the Financing of the Traffic and Road-Building Network), which has been regularly expanded in the budgetary laws to “other traffic and transport-policy purposes in the domain of the Federal Minister of Transport” since 1973.⁵⁷

The VIFG has been commissioned by the Federal Ministry of Transport to distribute revenue from the lorry toll to the modes of transport road, rail and waterways (only roads beginning in 2011), to steer use of the toll revenue towards federal trunk roads and to assume tasks in connection with the implementation of non-public-sector projects in the transport and traffic area. This is intended to allow the VIFG to secure the earmarking of toll revenue laid down in the Federal Trunk Road Toll Act (Bundesfernstraßenmautgesetz) and create transparency between the intake and use of revenue. The VIFG will manage not only toll revenue, but also all financial resources relating to construction on federal trunk roads beginning in 2016.

Challenges faced in the provision of infrastructure

The biggest challenge facing the provision of infrastructure over the past decades has been neglected investment in the maintenance of the existing stock. To change this it will be necessary to either reduce new construction drastically below the levels specified in the requirements planning or to apportion a significantly greater amount of resources. Practice in registering projects in the German Länder has thus far been characterised by a tendency to overstate actual needs for construction of new infrastructure. The

share accounted for by maintenance in total maintenance has only increased to 40 per cent in recent years.⁵⁸

Failure to invest in maintenance over the years has brought about a considerable need for additional investment in the maintenance and expansion of traffic infrastructure in Germany. In its assessment of sub-par funding for all transport routes, the Bodewig Commission (2013) quantifies the deficit in spending at around EUR 7 billion, with EUR 1.3 billion a year being solely accounted for by federal trunk roads.⁵⁹ This amount emanates from deficits in funding for ongoing maintenance and operation plus backlogged needs, whereby it is assumed that the backlogged needs that have come about will be reduced over a period of 15 years.

Potential is also offered by more efficient use of resources. Thus the President of the Federal Accounting Office in his capacity as Federal Commissioner for Efficiency in the Administration has drawn attention to inefficiencies in the execution of federal trunk road projects (2004, 2014) and called for a departure from the model of administering contracts (Auftragsverwaltung).⁶⁰ Among other things, he has identified a lack of cost transparency, which impedes the recognition of cost risk, thus limiting possibilities to make corrections in the planning and construction phase. He has also appealed for a better cost-management system in which more realistic costs are consistently determined in planning and building progress. The precondition for this is an improved flow of information between offices administering contracts and the Federal Ministry of Transport.⁶¹

Recommendations for action: an infrastructure enterprise for federal trunk roads

In view of the problem, the Expert Commission sees an urgent need for action to eliminate the existing backlog in investment, especially in the area of federal trunk roads. The aim has to be to make procurement processes and pro-

57 Cf. e.g. Federal Gazette (BGBl.) 2007 I p. 3227.

58 Cf. Kunert, U. und H. Link, Verkehrsinfrastruktur: Substanzerhaltung erfordert deutlich höhere Investitionen, DIW Wochenbericht 26/2013.

59 Cf. the document setting out the concept of the Commission, “Nachhaltige Verkehrsinfrastrukturfinanzierung”, September 2013, pp. 8 pp.

60 Cf. pursuant hereto the Federal Commissioner for Efficiency in the Administration, Gutachten zur Neuordnung der Verwaltung im Bundesfernstraßenbau, 2004, and the Federal Commissioner for Efficiency in the Administration, Gutachten über das Kostenmanagement im Bundesfernstraßenbau, 2014.

61 Cf. on this also the Reform Commission, “Bau von Großprojekten“ at the Federal Ministry of Transport, preliminary report on the theses developed by the working groups, 2014.

ject realisation more efficient in order to be able to meet the challenges of a long-term, sustainable funding of infrastructure. The task is moreover to ensure that sufficient capital can be mobilised for the operation, maintenance and expansion of the traffic infrastructure. To produce a long-term, sustainable solution, the Expert Commission calls upon the Federal Government to review the establishment of an **infrastructure enterprise for federal trunk roads (traffic infrastructure enterprise)** that exhibits the five following crucial elements

- i. **The building, maintenance and operation of federal trunk roads should be based on the lifecycle approach.** To achieve gains in efficiency, an infrastructure enterprise should ensure the planning, building, operation and funding of federal trunk roads “from one set of hands“. The public sector is to continue to be in charge of determining projects.
- ii. **Local communities’ capacities to take out loans without a state guarantee.** To ensure the conformity of an enterprise with the Maastricht criteria, there must be a clear demarcation between the enterprise and the state sector. The capacity of an enterprise to take out loans should be ensured by (1) the enterprise receiving sufficient sources of revenue; (2) it being capitalised on an adequate scale by public financial resources.
- iii. **The financing of federal trunk roads should primarily or solely come from fees paid by users without causing car users to incur any more expenses.** The transition to a user-based financing through earmarked contributions offers a broad possibility to finance federal trunk roads that is based on those parties causing the costs.⁶² If existing tolls are not sufficient, the enterprise must either (1) receive an additional source of revenue financed by taxes (for example from motor vehicle tax), or (2) the financing of users must be increased while at the same time increasing compensation (for example, by reducing the motor car tax).
- iv. **Preservation of public control.** Existing arrangements pursuant to legal and technical supervision as well as parliamentary legitimation should remain unaffected by the creation of an infrastructure enterprise for federal trunk roads.

v. **Independently of the specific design, there should be no “privatisation” of federal trunk roads.**

The ideas discussed in the foregoing regarding the structuring of a Federal traffic enterprise offer various possibilities for the institutional design of such an enterprise. The organisation and the demarcation of domains of responsibility are of fundamental importance here. The exact design of such an enterprise lies outside of the framework of the discussion within the Expert Commission and should be subjected to careful review by the Federal Government. In part, these ideas involve the distribution of tasks between the Federal government and Länder and should therefore be discussed within the framework of the reform of the Federal Government-Länder financial compensation scheme.

a. Organisational model

The decision on ownership arrangements for an infrastructure enterprise, which on the basis of the underlying conditions described in the foregoing would specify the tasks as well as the powers of such an enterprise, is of fundamental importance. The Expert Commission does not prefer any certain model per se. Instead, it is recommended that the experience of other countries with various organisation models be used to spell out and lay down the details for such an enterprise. There are basically two different paths regarding the ownership structure for a Federal traffic enterprise that are conceivable under the said premises:

Traffic infrastructure completely owned by the federal government. An initial possibility to implement a Federal traffic infrastructure enterprise is the creation of an enterprise that is 100 per cent owned by the Federal government. Its organisation would hence be the same as in the Austrian model, which has created a private entity owned by the Federal government in the guise of ASFINAG. Such a construction would create a possibility to transfer responsibility for federal trunk roads to the enterprise. In its capacity as sole shareholder, however, capitalisation of the enterprise would have to be carried out completely by the Federal government and in addition through the involvement of private financial resources through the issue of bonds or profit-participation shares.

62 According to preliminary estimates by the Federal Ministry of Transport and Digital Infrastructure, between EUR 3.2-3.4 billion are available from revenue from the lorry toll from 2016. An expansion of the toll obligation to all federal roads would lead to additional revenue in the amount of EUR 2.1 billion per year, while expansion to the range of motor vehicles weighing between 3.5 and 7 tonnes per year would add an additional EUR 100 million. Net income from the infrastructure levy (car toll) would probably be approximately EUR 3.7 billion per year.

Alternative financing model for highways in Europe: ASFINAG

The example of Austria – the ASFINAG model

In Austria, ASFINAG, which is a privately organised enterprise owned by the Federal government, funds approximately 2200 km of highways. The enterprise received a so-called “usufruct right” providing it powers to charge user fees for highways (revenue powers) for 50 years in 1997. The investments made by ASFINAG comprise both investment in the expansion of highways (expansion and construction of new highways) as well as investment to operate and maintain the road network. ASFINAG issues bonds to raise capital which are backed by a guarantee by the Republic of Austria. ASFINAG is not assigned to the Austrian state sector, which means that its debt is not taken into account in reviewing adherence to the Maastricht criteria.⁶³

The example of France – concession model

In France the central state bears responsibility for the administration and funding of the national road network. New construction projects for motorways in France have been carried out in the recent past mainly using a concession model, within the framework of which a private operator receives a contract to finance, build and operate a section of a motorway by concluding a concession agreement. Financing is performed using revenue for usage that the concession-holder charges users itself. The strategy underlying this model is thus the same as the F model used in the case of PPPs in Germany, which is however limited to special construction projects in Germany under Article 3 of the Trunk Road Private Financing Act (FStrPrivFinG) and has thus far scarcely been used.

In addition, there has been an additional financing model involving private parties within the framework of a so-called partnership agreement in France since 2004. In this model, private providers are commissioned with the financing, construction, operation and maintenance of a motorway project through a long-term agreement. In contrast to the concession model, the private enterprise does not charge people for usage, however, instead receiving previously agreed payments from the state on a regular basis.⁶⁴

The approach in this model is similar to the German A model, in which remuneration of the private party takes place in different ways. While the private entity in Germany receives payments from toll revenues for the segment of highway, other resources are available in France for this remuneration. The *Agence de financement des infrastructures de transport de France* (AFITF) is responsible for all financing issues in the area of road traffic infrastructure in France. Its powers are at the same time solely limited to the financing of infrastructure projects and thus include payments made to private entities within the framework of partner agreements that are concluded. The revenue of the AFITF came from four sources in 2014 (revenue from levies paid by operating companies that were awarded concessions as well as from the *taxe d'aménagement*, revenue from traffic fines and a grant from the government budget. Revenue from an ecology tax on lorries (TICPE) is to be added to this beginning in 2015.⁶⁵

The Austrian experience shows that there needs to be a clear demarcation of jurisdictions between the enterprise and the state when constructing and operating enterprise that is owned by the Federal government. This is especially the case with regard to debt taken on by an enterprise that is not assigned to the government sector and thus is not

supposed to be taken into account when reviewing adherence to the European Stability and Growth Pact. In order to produce a clear focus regarding this point, the Expert Commission advocates the Federal Government not issuing any guarantees when the enterprise takes out loans.

63 Regarding the institutional design of the ASFINAG model, see for example Beckers, T., A. Brenck, C. von Hirschhausen and J.P. Klatt, Die ASFINAG und das österreichische Modell der Fernstraßenfinanzierung, discussion paper WP-TR-02, April 2005.

64 For a summary of the French concession model, see e.g. the Best Practices Study on traffic infrastructure planning and financing in the EU, study by Roland Berger Strategy Consultants commissioned by the BDI, AGV MoVe, BBS, Allianz für eine zukunftsfähige Infrastruktur, HDB, Pro Mobilität – Initiative für Verkehrsinfrastruktur e.V., VDA und VDV, Berlin, October 2013.

65 Cf on this loi n° 2014-1654 du 29 décembre 2014 de finances pour 2015 and information from AFITF, e.g. <http://www.afitf.net/les-recettes-affectees-a-l-afitf-a105.html>.

Traffic infrastructure enterprise with private shareholders. An additional possibility regarding institutional design is an enterprise in which the Federal Government owns a majority of shares, but in which a minority stake by private entities would be possible. Involvement of private entities in an enterprise would ease capitalisation in the form of private equity. The financing risk would thus be split up between public and private shareholders instead of being shouldered solely by the public shareholder. A design like this would have to be subjected to a detailed review of possible conflicts of interest, however, which could be involved in the possible participation of groups which for their part are involved in the execution of infrastructural projects. No transfer of title to the enterprise for federal highways should take place with this model. The ability to execute such an option is questionable, however, and needs to be analysed. Especially the question as to what criteria are to apply to returns on private equity under such a model remains unresolved.

b. Tasks and powers

To ensure investment in traffic infrastructure that is as sustainable as possible, a traffic infrastructure enterprise should pool both responsibility for financing as well as responsibility for construction and operation. Generally speaking, a bandwidth of powers and tasks for the enterprise is conceivable and could range to include the following areas of activity:

- Substitute investment to maintain road traffic infrastructure at the Federal level including investment in traffic safety,
- Investment for expansion earmarked for expansion and construction of new highways,
- Operation of federal trunk roads.

The infrastructure enterprise should perform its tasks in line with political targets and be subject to strict efficiency criteria. In order to leverage existing latitude to meet these efficiency demands, it should therefore be able to decide by itself whether it outsources tasks or performs them itself. In performing expansion or new construction projects, it would thus be able to award contracts for the execution of

projects to third parties. This could take place, for example, in the form of awards of concessions as it is practiced in France.⁶⁶ The precondition for awarding contracts like this is a comprehensive review of the procurement variant available by the enterprise based on efficiency criteria.

It is not necessary to transfer responsibility for requirements planning to the enterprise. Planning should continue to be based on the Federal Traffic Routes Plan and the requirements planning of the Federal Government.

c. The need for financial resources and financing

Responsibility for financing would be transferred to the traffic infrastructure company when it is founded. It should assume the economic risk completely. To this end, the enterprise would need sufficient equity. Fees for usage of federal trunk roads should go to the enterprise to finance its investments. Long-term secure footing for the revenue of the enterprise would thus go hand in hand with a change in financing of traffic infrastructure from a system that is for the most part based on the government budget to financing by users. This would be associated with an earmarking of revenue from usage for the operation, maintenance and expansion of respective traffic infrastructure. The following should apply to the specific design of a user-financed model:

- **The user-pays principle:** Assignment of the costs in line with the user-pays principle, which is contingent upon the distance travelled, makes it possible to provide users with maximum transparency of the benefits and costs of using the infrastructure.
- **Involvement of all traffic actors without any additional financial burden being placed on them:** Assignment of the costs in line with the principle of the user pays means that all traffic actors participate in the financing of use. In concrete terms, this means the introduction of a usage-based toll for all categories of motor vehicles in Germany.
- **Steering of usage:** If usage fees are paid contingent upon the distance travelled, there is a possibility for price incentives to be used to contribute to more efficient use of the infrastructure.

66 Cf the box “alternative financing models for highways in Europe “.

Beyond this, it would be possible to raise capital from institutional investors. To achieve this, the enterprise could issue bonds, in this manner creating investment opportunities for institutional investors. To clearly demarcate the enterprise from the state and the accusation that a “shadow budget” is being created, no guarantees would be issued by the Federal government for such. Risk would therefore be transferred to private investors. The enterprise would hence not be assigned to the government sector like other Federal-owned enterprises.

d. Underlying regulatory conditions

In addition to a detailed conception for the traffic-infrastructure enterprise, appropriate direct framework conditions need to be established, as the traffic infrastructure is a sector that has forward and backward linkages to the entire macro economy. The supervision of the enterprise by a regulatory authority which lays down framework conditions and standards to apply to it as well as user fees is of fundamental importance. Institutionally speaking, this supervision could be placed in the hands of the Federal Network Agency. Just like with the infrastructural enterprise, the regulatory authority would need to be outfitted with the proper know-how for such a task.

The cost of loan capital should be recognised in (price) regulation by the regulatory authority. The cost-coverage principle should apply to toll revenues, as stated above, whereby interest on equity capital invested could also be taken into account. This could serve as a strategy for calculating a return (on capital equity capital) for private capital.

Possibilities for institutional implementation

To implement the proposals for the creation of an infrastructure enterprise for federal trunk roads proposed by the Expert Commission, it is necessary to adjust the legal foundations relating to the administration of contracts by the German Länder, in particular Article 90 of the Basic Law. The Expert Commission is aware that the creation of a traffic infrastructure enterprise at the Federal level thus constitutes a long-term initiative to secure the financing of federal trunk roads, but is at the same time of the opinion that such an enterprise would offer a solution to securing investment in road infrastructure at the Federal level on a sustainable basis.

In order to obtain a practicable strategy to create a traffic infrastructure enterprise, the Expert Commission in general believes that different strategies could be successfully implemented. Thus, instead of a centralised traffic enterprise, several regional enterprises involving participation by the German Länder could be established and successively expanded following a pilot stage. The pooling of powers at the regional level could offer a practicable transitional framework in creating a long-term institutional framework for a central enterprise.

As an alternative, a central traffic infrastructure enterprise could be created at the Federal level right from the outset, whose tasks would initially be limited to motorways, however. Roads would initially continue to be managed within the framework of contract administration. Just like with the founding of regional enterprises, the creation of a “leviathan authority” would also be avoided. If the enterprise proves to be useful, it could be assigned responsibility for federal roads at a later point in time.

3.C. Mobilisation of additional private financing of infrastructure

As described in chapter 3a, the vast majority of infrastructural projects in Germany are financed by public financial resources, bank loans or fixed-interest bonds issued by the public sector. By the same token, most risks remain in the hands of the public sector. Attempts to secure against such risks have usually been carried out by means of PPPs thus far, in which private investors finance and are supposed to bear responsibility for the risk for mistakes in construction and operation or other risks. This means, however, that the public sector has to pay high financing costs for this transfer of risk. Moreover, the public sector is not always successful in transferring risk. In extreme cases – for example, when a private contractor becomes insolvent, risks revert back to the public sector.

The Expert Commission therefore advocates reviewing new procurement and financing structures in which public institutions play a stronger role than in the case of PPPs, but the possibility of private financing along the lines of true transfer of risk to private entities is retained. Generally speaking, the infrastructure could be financed at all three levels of government – municipalities, the Länder or the Federal government. Just like the measures that are proposed in chapter 3.A, an additional impetus for investment could be created in this manner. Two possibilities are outlined in this section:

- i. A **public fund** which – similar to a private infrastructural fund – would make equity capital financing of projects available along with the usual structural, coordination and supervisory functions of a major investor. Institutional investors would have the possibility to invest in this fund at their own risk. If need be, the business model of promotional banks already in existence could be expanded in this direction.
- ii. A “**citizens’ fund**” or citizens’ participation in different varieties oriented towards individual savers.

The potential additional benefits offered by these institutions compared to existing private infrastructural funds and capital pooling would be:

- It could entice additional groups of investors – pension funds for the free professions, company pension schemes, foundations or small and medium-scale insurance companies and private investors – which at present do not have any access or only indirect access to infrastructural investment. This could first of all help reduce financing costs for infrastructure and secondly stimulate broad involvement in more direct identification with infrastructural projects by citizens.
- The avoidance of certain disadvantages of the PPP model such as high negotiating costs, unreasonable distribution of risk and a lack of flexibility. The latter has its price, however: it requires clear rules and a strong internal decision-making structure which takes into account the interests of public principals without at the same time neglecting the enterprise or its shareholders.

Infrastructural funds: possible variants

Public intermediation of private infrastructural financing can be implemented in various models. What they have in common is the “assets side” in the form of a portfolio of equity (and possibly loan capital) investment in infrastructure projects.⁶⁷ There would be differences on the liabilities side of the balance sheet, however, i.e. in the manner in which these investments are financed and how risks are spread.

What all of the models have in common is the question as to how the interests of public customers can be harmonised with those of private investors that take part and participate in the risks. This should generally be possible: for instance, successful development and subsidy banks and other institutes governed by public law show that there is no contradiction between the execution of tasks on behalf of the public sector and commercial sustainability. The interests of public customers could moreover be protected by having the infrastructure enterprise described in Chapter 3.A identify suitable projects and represent the public-sector customer in negotiations with the fund.

Two models are outlined in the following. They require in-depth development and review. This includes in particular the design of internal governance rules for the outlined institutions, but also regulatory and state-aid aspects. There may be other variants as well.

a. Classic infrastructural funds on the public behalf

These variants would be orientated towards existing private infrastructural funds. Because the projects upon which these are based are at present short of liquid funds by comparison, they would be pooled in one or more “closed” fund. Shareholders (subscribers of a fund) would not have any possibility to buy back their shares in the fund. If they want to liquidate their shares, they have to find another investor that is prepared to buy them.

The public mission would in this model be reflected in a list of criteria according to which projects are selected and structured (including a pricing policy in line with market terms that is oriented towards payments of fees as stipulated in contractual agreements). Private investment would only then be involved when the projects have been negotiated in harmony with these criteria, so investors know what they are getting into. The transparency and quality of studies of efficiency proceeding this therefore play a key role. The fund management would subsequently be responsible for carrying out the projects that have been negotiated as economically as possible – and thus in the interests of investors.

67 To avoid conflicts of interests and confusion of the role of outside loan providers and equity investors, the intermediary should invest *either* equity or loan capital in a project.

The performance of this double task – executing the public mission while at the same time defending the interests of investors – is characterised by an inherent conflict of interests and for this reason must be closely monitored. The supervisory board of the enterprise as well as the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin) are possible candidates here. The credibility of the effort to defend the interests of investors could moreover be enhanced by having the public sector itself participating in the fund as an investor.

As has already been described in the foregoing, an alternative possibility of rendering the interests of customers compatible with those of investors would be to have the public sector mission not be carried out by the infrastructure fund, but rather by the infrastructure enterprise described in chapter 3.A. In this event, the fund could also concentrate on satisfying the interests of its shareholders.

b. Models based on an existing promotional bank

As an alternative to the fund solution, it could be reviewed whether and to what extent it is possible to add an additional function to the existing business model of promotional banks, namely transfer (at least partially) of the risks of infrastructural projects to private investors. To this end at least two preconditions must be met. First of all, the promotional bank has to be supported more than in the past in investing equity in infrastructure. Secondly, a mechanism has to be found with which the risks associated therewith can be transferred to private investors at least in part. There are basically two mechanisms possible here:

- Co-investment at the project level with infrastructure funds or other institutional investors that for their part serve as capital-pooling points, in this manner passing on risk on a pooled basis, and/or
- In part “outsourcing” the risks assumed by equity capital investments by means of issuing securities, whose returns are based on the economic success of a combination of projects just like investment in a fund.

Citizens involvement and “citizens’ funds”

Aside from institutional investors with a long-term perspective, like life insurance companies or pension funds, individual investors may also generally be interested in the models described in the previous section. This would expand capital available to the infrastructure by adding another group of investors. Vice versa, these investors would be offered a new form of investment that holds out the promise of better returns with a reasonable risk level compared to, for example, savings accounts or day investments or treasury bonds. On top of this, there are also non-financial motives at work: involvement of citizens would also constitute a contribution to society. In the case of major projects, this could also help reduce bias or misgivings and concerns.

One possible form of citizens’ participation would be a **direct investment by citizens in the aforementioned infrastructural funds**. Citizens would accordingly bear two types of risks: first of all the fund – in spite of diversification of risks – could suffer losses over the entire term (monetary risk). Secondly, losses could be incurred if a premature divestiture occurred no purchasers were found (liquidity risk). Generally speaking, the fund therefore is only suited for citizens who want to save over a long period of time (20 to 30 years) and do not have to sell their shares in the short term. There should not be any guarantee on liquidity by the state. A guarantee on the value of investments up to a certain amount (for example, EUR 50,000) would be conceivable, however, i.e. a guaranteed minimum return of zero over the entire term of the fund for small investors. At the same time, however, the maximum return would be capped at a maximum level. The amount of the ceiling would have to be estimated in such a manner so that the guarantee is neutral in fiscal terms (no subsidies). If the state takes on the entire risk of losses from its citizens over a long period of time, interest on the investment will also therefore only be very low (under current market conditions).

An alternative to direct citizens’ participation in the form of an infrastructure fund could be an independent pooling site for citizens’ financing of infrastructure – a **“citizens’ fund”**. This could be organised as a public fund and it could diversify its investments accordingly. In addition to equity, mezzanine capital and debt capital could be invested. To meet the regulatory requirements of an open public fund, the fund would have to primarily hold securities traded on public exchanges or other issues of securities, for example

from building or operator enterprises at the local or Länder level, or municipal infrastructure bonds (project bonds). Compared with direct citizens' participation in the closed infrastructure fund outlined above, the advantage of this solution is that the liquidity risk borne by citizens would be much lower. The disadvantage would be that the direct link to certain infrastructure projects would be largely lost.

A third option which creates this link and could coexist with the aforementioned models would be **direct citizens' participation in bonds** for certain major projects (or pools of projects). Because this would involve debt capital, however, the risk borne by citizens would be comparatively low, as would be the expected return on investment.

Citizens' participation could also be fostered under the German Capital Accumulation Act (*Vermögensbildungsgesetz*) (bonus encouraging employees to save). To strengthen the identification of citizens with the investments they help finance, special transparency and information obligations for the types of participation in infrastructure could be stipulated inter alia in the Act Protecting Investors (*Anlegerschutzgesetz*) to ensure that citizens can inform themselves – for example about project progress or key financial data on use of the infrastructure. A “second Prokon case” should and can be prevented in this manner.

The Federal Government should review under what conditions – including under legal and budgetary law provisions – participation of citizens can be implemented in infrastructure projects in the form of citizens' funds and how citizens' participation or citizens' funds would need to be specifically designed.

A European dimension

Generally speaking, the fund described above or bank could be allowed to not only invest in Germany, but also in infrastructure in other European countries, for instance alongside the EIB within the framework of the “Juncker Plan” (on this see chapter 6). This would make a contribution to the investment of German savings in other European countries, consequently strengthening investment at the European level.

The EIB or the European Fund for Strategic Investment (EFSI) could vice versa co-finance infrastructure projects in Germany that are pooled through a German fund or bank. This would lead to a broader diversification of projects than the EIB or EFSI could achieve on their own.

4. Framework conditions for private investment

4.A. Overarching measures

One important reason for the competitiveness of the German economy is the extraordinary mixture of business enterprises. There are successful large joint-stock companies, countless highly effective small enterprises and self-employed persons – and a broad strata of small and medium-scale enterprises. These enterprises, often family-owned, are not always in the limelight, but they produce a great deal of innovation and are often successful in global markets as “hidden champions”. At the same time they create jobs and contribute to the positive development of their home region as a traditional headquarters for companies. This diversity of business enterprises is an important stabiliser that has especially helped Germany over the past few years to make it through stormy phases in the global economy.

Poor in natural resources, Germany is not least dependent on business enterprises for its economy to grow – characteristics which are especially commonplace among small and medium-scale family-owned enterprises. Typical features of family-owned enterprises are generally their long-term orientation and loyalty to certain sites and regions. 99.6 per cent of business enterprises in Germany are small and medium-scale (SME), i.e. they employ fewer than 500 staff.⁶⁸ Small and medium-scale enterprises are usually managed by the owners (family-owned enterprises). At present, SMEs only account for a small share of research in Germany, however.⁶⁹ On top of this, the private sector has been rather restrained with regard to investment over the past few years due to the weak economy. In other words: weakness in investment in Germany also has a private and SME facet as well. Any program designed to create an impetus for investment also need to take this aspect into account.

This report dedicates a special chapter to important fields of action for a political framework designed to promote investment. This applies to the framework conditions for investment. The question of tax treatment of equity financing plays a key role in this connection as well. Generally speaking, there are additional tax-related strategies

to support private investment such as, for example, the elimination of elements involving taxation of costs. As a result of their tax implications, the Expert Commission was not unanimous regarding these strategies, and for this reason they were not discussed in any detail. Incentives for investment could in addition be achieved by the reintroduction of digressive depreciation. It is true that this would lead to lower tax revenue. Because this would only involve a shift in the time period when taxes are paid, however, it would only be temporary. Tax revenue should return to its original level over a time period of five years.⁷⁰ The impact of digressive depreciation on business tax should be taken into account, however. At the current at the present point in time, even only a temporary reduction in municipal tax would be counterproductive in terms of investment activities by municipalities and local communities. This could be avoided by temporary compensation for tax-revenue losses of municipalities by the Federal Government or Länder.

In the area of **energy supply**, it can be assumed that there will be a great need for investment in the production of electricity, grids, efficiency and the heating market in the coming years (see section 5.B). A significant amount of investment by energy consumers will also be necessary for investment in efficiency and heating, for example in order to implement load-management measures or energy-related refurbishment of existing buildings. According to official statistics, EUR 23.7 billion to EUR 26.3 billion in investments were made in the energy supply over the period 2008 to 2013. To make the energy transition a success, continued high investment in energy production and networks as well as the heating sector are necessary. According to various studies, investment of around EUR 280 to EUR 310 billion will be needed in the area of the German energy supply up until 2030, approximately EUR 160–210 billion already by 2020.⁷¹

More than half of investment expected to be necessary by 2020 will be in renewable energy sources. These investments will be passed on as costs through the EEG surcharge (under the Renewable Energy Sources Act) or grid fees to electricity consumers. An energy and economic policy focusing on investment therefore has to take these cost-distribution aspects into account.

68 Institut für Mittelstandsforschung Bonn, <http://www.ifm-bonn.org/mittelstandsdefinition/definition-kmu-des-ifm-bonn/>.

69 Stifterverband für die Deutsche Wissenschaft: Zahlen und Fakten aus der Wissenschaftsstatistik GmbH im Stifterverband, February 2014.

70 Temporary reductions in tax revenue with a 25 per cent official tax depreciation rate would according to estimates of the Federal Ministry of Finance amount to approximately EUR 4.5 billion between 2009 and 2012 (Cf in this regard see also IMK, Öffentliche Haushalte 2008/2009: Spielräume für ein Konjunkturprogramm unzureichend genutzt, Report no. 33, November 2008.).

71 Netzentwicklungsplan 2012; DENA Verteilnetzstudie 2012; BMU-Leitstudie 2011; Roland Berger.

A stable regulatory environment is moreover important to greater investment activities, especially for energy users. There is still uncertainty in this area at present. That is why a foreseeable development with regard to the elements of the electricity price for which the state is accountable, which accounts for a significant portion of electricity cost for some companies, is all the more important.

Another critical aspect is differences in investment activity in manufacturing industry and services. The German economy depends on **value-creation interrelationships** between industrial sectors and services that feed into these. That is why special attention must be devoted to the ongoing deterioration in investment activities in some sectors of manufacturing industry (for example areas characterised by intensive energy use) as well as some service sectors (for example, traffic and telecommunication). The maintenance of modern value-creation change in Germany, however, requires balanced investment in networked fields like these.

In this connection it should be noted that those areas that are highly dependent on **domestic demand** are suffering disproportionately from a long-term weakness in investment.⁷² Framework conditions that stimulate private consumption demand in Germany therefore promote investment as well.⁷³

The **digitisation** of the economy faces business enterprises with major challenges.⁷⁴ In many cases it requires considerable investment in equipment with respect to information and communication technologies, in the linkage of these technologies to goods and services to create new products, in supporting services and high-speed network infrastructures. Especially here questions relating to financing through debt capital, equity and perhaps support for financing by the state (subsidisation, direct commitment, guarantees, etc.) play a special role. The investment potential associated with digitisation can only truly unfold, however, if economic policy properly lays down

the direction for the “digital state”. In addition to the expansion of digital infrastructure, in particular the expansion of broadband (see chapter 5.A), this also includes a good electronic administration (E-government) including an efficient digital financial administration and Internet-based access to government support programmes.

An efficient and nimble **public administration** is also needed to set aside land for businesses enterprises to build on, an issue which receives too little attention. “Less is more” appears to be the slogan in many places with regard to the allotment of land, thereby placing shackles on companies' growth, as investment is often associated with sheer physical growth of facilities as well. The needs of business can be met in a sustainable manner by means of strategic land management and more networking in the local community coordination of interests in the field of regional and urban development.

Reliable underlying conditions for more private investment include those that strengthen private demand in the form of consumption and demand emanating from the government along with fields examined individually in detail in the following chapters, conditions underlying the financing of long-term private investment, securing skilled labour, the avoidance of unnecessary bureaucracy and preservation of access to international markets. In general one can say that a crucial factor in strengthening private investment is for economic policy to be consistent and reliable and to avoid abrupt changes in course to the extent this is possible.⁷⁵ Policymakers and societal actors should devote special attention to improving the acceptance of investment projects – including through close involvement of the public early on.

72 DIW Berlin, HRI (2014). Private Investitionen in Deutschland. Gemeinschaftsausschuss der deutschen gewerblichen Wirtschaft. Berlin. “The strong drive in Germany's goods exports to its global markets may therefore explain why the investment weakness has not manifested itself for machinery and equipment throughout most of the last decade.” (European Commission, Macroeconomic Imbalances Germany 2014, p. 45, at: http://ec.europa.eu/economy_finance/publications/occasional_paper/2014/pdf/ocp174_en.pdf)

73 The health industry could offer structural opportunities here, for example. Expenditures and employment in this area have skyrocketed in recent years. Demographic change will have an especially significant effect on investment behaviour especially in this area in the future.

74 Wirtschaft 4.0 – Große Chancen, viel zu tun, DIHK-Unternehmensbarometer, 2015. BDI. Die digitale Agenda. 2015.

75 Deutsches Institut für Wirtschaftsforschung und Handelsblatt Research Institute (2014). Private Investitionen in Deutschland, study commissioned by the Gemeinschaftsausschuss der Deutschen Gewerblichen Wirtschaft (Joint Committee for the German Manufacturing Industry). Düsseldorf. 2014.

Investment on the basis of long-term financing

One important factor in being able to plan especially for small and medium-scale enterprises is the long-term financing of private investment. The stricter regulation of financial markets that has rightly been instituted as a result of experience in the financial crisis has had negative consequences for the long-term financing culture in certain areas in Germany, however.⁷⁶ Access to long-term financing sources at calculable costs can be impeded as a result.

Liquidity requirements for banks, which have been increased within the course of Basel III, make good sense and should be welcomed. Although designed to serve as observation criteria, they are already influencing the steering of business by banks in a manner that can strangle the availability of longer-term investment financing. The long-term liquidity ratio (NSFR) that is being planned, regarding the implementation of which the EU Commission is to submit a proposal in 2016, could have a negative impact on transformation of periods and hence on the healthy division of labour between credit institutes and business customers if it is not well designed. A single business enterprise cannot safeguard itself against risks emanating from possible future changes in interest levels or difficulties in obtaining knock-on financing as well as a bank, which carries out various transactions, hedging operations often being among them. Already at present, the NSFR is having an influence on how banks (including smaller institutes) steer their business, causing them to stay away from long-term investment loans. In addition, loss of the corrective factor with regard to **equity backing for loans to SMEs** in the Directive implementing Basel III could negatively impact financing of investment. Discussions about these issues are taking place between European regulatory authorities and institutions at present. The results are also to be implemented in 2016.

Stricter **solvency requirements** for insurance companies and increased equity backing for securitisations also pose a burden on long-term financing of investment projects. On the whole, there could be a shift in financing risks to businesses that depend on loans, causing investment conditions to deteriorate.

Securing skilled labour in order to secure investment

Business investment decisions are closely related to the availability of qualified skilled labour. If an enterprise finds itself confronted with a shortage of skilled labour, it may refrain from investing in expansion. Shortage of skilled labour has in the meantime become one of the biggest business risks facing companies that would like to expand their capacities⁷⁷.

With regard to the urgent need to secure skilled labour, demographic change and economic structural change are posing major challenges to enterprises, policymaking and society: the demographic shift – although there are considerable regional disparities here – is causing a significant decline in the population of working age. At the same time, the ongoing structural change towards knowledge-intensive industries and services means more demanding requirements with regard to the skills of many employees. Given this, it remains an important task to reduce the large number of people who do not have any secondary school or vocational degree and make it possible for more people to obtain a higher level of qualifications on the whole.⁷⁸

Also necessary is greater permeability between vocational and academic education and training. On the one hand, more persons with an Abitur degree need to begin studying at university and be able to complete their studies: the Conference of Ministers of Education attempted a cau-

76 This term is meant to designate bank financing (in contrast to capital market financing using the instrument of bonds and securities), which is predominant in Germany – particularly in comparison to Anglo-Saxon countries – and close customer relationships associated with this (the principle of the “company bank”).

77 Cf. e.g. company responses regarding business risks in surveys on the economy conducted by the German Chamber of Industry and Commerce.

78 At present there are almost 260,000 young people involved in wide-ranging measures in the transition from secondary school to training. They often have poor chances of obtaining a vocational degree. In general a change in paradigm is needed in Germany which leads away from numerous measures in parallel systems and instead in the direction of on-the-job training at companies that is then professionally supported wherever needed. An important impetus has been generated here in the Alliance for Initial and Further Training through the introduction of assisted training and the expansion of assistance and aid accompanying training. This path needs to be consolidated and expanded.

tious opening of access to universities for people with vocational experience in the “Stralsund decision” from 2009. The Ministers of Education have eased formal access. Thus, persons holding master craftsmen certificates are entitled – at least by law – to study at university. Aside from people with master craftsmen certificates, however, people who do not have an Abitur degree are still confronted with various barriers to access in a Federal patchwork system that requires several years of vocational experience in some cases, while providing for admittance exams in others. These barriers to access must be eliminated.

The task is to design the dual system to be a hybrid form between vocational and university education. With dual studies programmes it must be ensured that they are not too closely tailored to individual businesses – and that the workload is not so great that students cannot study at the same time. Company training and study at universities must be linked in a systematic manner, while both places of learning have to be structurally intertwined and their strategies coordinated. National quality standards are necessary for this.

With a view to a future-oriented qualification strategy, further vocational training has to be expanded as well. The different sets of skills possessed by heterogeneous company staffs should be strengthened. This first of all requires expansion of classic further training measures and continuing training for vocational advance. To this end employees need clear framework conditions, transparent structures and financial support. This also involves, however, an organisation of labour at companies that promotes learning in such a manner so that learning can already take place on the job. Here vocational and company further training should also be focused on new participation-oriented forms of learning, which can once again be supported by IT.

In Germany, policymakers, business and trade unions are rightly working more to boost the **number of women in work**. Family-policy measures that run counter to this objective – such as childcare benefits for home-based care – should be reviewed. In addition to an adequate supply of childcare places, investment in the expansion of all-day schools must be stepped up significantly. At present not even one-third of all children and teenagers attend an all-day school even though 70 per cent of parents would like to have their children in an all-day school. The aim of policymaking must be to expand this availability to meet needs by 2020. This will require 13 per cent in annual

growth in all-day places at schools and an investment volume of EUR 1.4 billion per year. Childcare benefits for home-based care could be used to finance this.

Because domestic potential is not sufficient, however, **immigration of foreign labour** has been taking on a much greater priority as a way to ensure skilled labour for business enterprises recently. Statutory immigration arrangements have been liberalised over the last few years, although additional steps in this direction are warranted. Vocationally qualified persons are only allowed to immigrate in professions where there are shortages at present; these are stated on a list by the Federal Employment Agency (above all technical and nursing care professions). This list should be expanded to meet needs. Elements such as the “blue card”, which has been used much too little by nationals from non-EU countries as a result of certain restrictions (university degree, minimum income level, tedious visa procedure) should be refined and further developed in a targeted manner. More transparency with regard to the preconditions for applications to be filed and an acceleration of the procedure could facilitate immigration of qualified employees from other countries.

In addition, the red tape involved in the often tedious review of priority for admittance to vocational training should be eliminated at least in professions where there are shortages. This can help reduce future bottlenecks of skilled labour. Immigration laws should be designed more simply on the whole, while existing rules should be better communicated. Otherwise major shortages will arise especially with regard to people with vocational qualifications in the near future. The large number of refugees at present should be taken as an opportunity to determine qualifications early on in order to make possible a change in status from asylum-seeker to immigration if appropriate so that these persons can take up employment. Young foreigners whose presence is tolerated who have found a training position in Germany should be able to also complete this, and there needs to be more legal and planning security for enterprises if they are to be employed after completing their training. It would make sense to issue temporary work permits for two-year follow-up employment at companies where young people receive training while taking into account security issues (3+2 arrangement).

Companies are moreover witnessing that their staff require skills that make it possible for them to deal with modern IC technologies in a creative and familiar way in

the modern, increasingly digitised working world.⁷⁹ There is a need for additional qualifications in the area of IT infrastructure security as well. The conveyance of such skills in primary and secondary school only plays a minor role here at present.⁸⁰ Schools need to be better equipped with modern IT technology, appropriate and sufficient continuing training programmes for teachers and have new technical devices in schools. This is important so that digitisation and the training of the skilled labour of the future can go hand in hand.

Good bureaucracy means more latitude for investment

One possible lever for promoting investment is the avoidance of unnecessary red tape and bureaucracy. As important as clear government rules are to legal security – an important advantage offered by Germany as a centre of business and industry – a reasonable balance taking into account the red tape companies have to deal with is also important here. In surveys industrial enterprises rate the location factor “legal security” as satisfactory (2.6), but assign the location factor “complexity and efficiency of tax law in practice” a mark of poor (4.5).⁸¹ Half of the companies surveyed believe that priority should be assigned to the elimination of bureaucracy, while almost 60 per cent call for simplification of tax law. The Federal Government is therefore seeking to reduce red tape caused by laws and regulations through the work programme “better legislation 2014” and has already initiated concrete steps through the planned Act Eliminating Bureaucracy (Bürokratieentlastungsgesetz).⁸² The elimination of bureaucracy should be performed in such a manner as to ensure that important objectives such as compliance with statutory rules and the ability of the public administration to act effectively are not jeopardised as a result.

The elimination of excessive bureaucracy also includes inter alia the depreciation limit for low-value capital goods. Fixed capital goods are supposed to be depreciated over the period of their usage. So-called low-value capital goods can already be completely depreciated in the same year in which they are procured. This leads to a considerable simplification of bookkeeping. The maximum amount for low-value capital goods has been at the same level of EUR 410 for decades. Given inflation over the period, it would be logical to raise the limit significantly. Additional reliable framework conditions from the perspective of companies also include required periods for storing documents under tax law, faster electronic accounting and communication between companies and financial authorities. If planning security could be created more quickly, this would free up resources for investment decisions.

International trade: a driver of investment

The amount of investment is decisively influenced by demand. In its capacity as an export-oriented, open economy, Germany is especially dependent on stable demand from abroad. German exports have developed extraordinarily well over the past few years, which has also helped avoid Germany's structural weakness in investment negatively impacting primarily export-oriented areas.⁸³

In times of global value-creation chains and international customer acquisition, the attractiveness of locations in investment decisions is increasingly being influenced by trade agreements and specific investment agreements. It is of major importance that free traffic in goods be preserved in the future as well and that it be made even more efficient within the framework of remaining possibilities. Better communication of the importance and the design

79 Cf DIHK (2015).

80 Cf Fraillon et al. (2014), p. 130 pp.

81 Cf DIHK (2014e).

82 Cf Bundesregierung (2014); Bundesregierung (2015).

83 Cf European Commission (2014), p. 45: “The strong drive in Germany's goods exports to its global markets may therefore explain why the investment weakness has not manifested itself for machinery and equipment throughout most of the last decade.” DIW Berlin und HRI (2014).

and structuring of globalisation processes is a precondition for the acceptance of these agreements. Especially industrial SMEs do not generally penetrate foreign markets with their own production sites, but rather through exports. Joint trade agreements are therefore an important encouragement in this direction.

Exporters depend on simple certification procedures and mutual recognition of standards to be able to supply foreign markets. Such recognition should not be automatically tantamount to an agreement on the "lowest common denominator", however. The level of protection in health, food, occupational health & safety or consumer matters that trading partners deem to be necessary should not be up for negotiation. Instead, unnecessary differences need to be identified and eliminated so that barriers to trade can be scaled down.

In view of the lack of progress within the framework of the WTO, the European Commission has adopted the strategy of negotiating increased bilateral trade agreements with strategically important partners and designing these in a comprehensive manner – an approach which is right in principle. With respect to trade agreements, the crucial factor in improving the attractiveness of a location for investment is for tariffs to be reduced on a broad front and the regime of remaining tariffs managed in an efficient manner. In addition to tariffs, especially non-tariff barriers to trade such as, for example, mandatory double certification in spite of the same protective level constitute a burden. Greater cooperation both at the bilateral as well as international level would help avoid future barriers to trade and bureaucratic impediments. Market access for investment can be improved and the disadvantages faced by foreign investors reduced. The same goes for public procurement here in Germany and in partner countries. Requirements for minimum regional value-creation are impediments to investment. The stipulation of general trade rules contributes to the achievement of a level playing field and an increase in planning security for investment decisions abroad as well. Empirical studies show that foreign investment by no means substitutes for domestic expansion of capacity or innovation, but rather supplements it.

The Expert Commission emphasises the importance of a trade policy that is based on ecological and social stand-

ards and which promote sustainable development in all countries. It must in particular maintain the sovereignty of parliaments, respect national and international standards protecting people and the environment, ensure self-administration of local governments and the performance of tasks, increased transparency in global value-creation chains and strengthen corporate responsibility and accountability obligations of business enterprises throughout the world.

4.B. Framework conditions for innovation

Innovation is generally defined as new objects being produced, adapted and successfully used in business and society. Innovations are by the same token the result of complex interactions between individuals, organisations and their areas of activity. Innovation policy faces a challenge in the form of international competition for researchers and investment by research-intensive enterprises. An important precondition for private and public innovation in Germany is hence its comparatively favourable framework conditions. These include qualified skilled labour, effective support measures and an openness on the part of society to the assumption of risks, without which no entrepreneurial activity and no innovation processes are possible. A crucial framework condition is not least solid financing possibilities.

Qualified skilled labour

An additional important framework condition affecting the long-term innovative capacity of Germany is qualified skilled labour. Innovation is produced by people whose qualifications and skills are decisive. The success of the German innovation model, which is heavily based on industry, is to be found especially in its engineering science system and the combination of work performed by highly qualified researchers and developers in tandem with skilled labour such as master mechanics and technicians. Key challenges arise here through demographic change, which will have a long-term impact on the age structure of gainfully employed persons as well as disproportionately affect demand for certain qualifications as a result of structural changes in the production of goods and services while at the same time reducing demand for others.⁸⁴ A shortage of academic and non-academic

84 Cf EFI (2012); EFI (2014).

skilled labour in mathematical, information, natural science and technical (MINT) professions would have a painful impact on Germany's capacity for innovation and competitiveness.⁸⁵

Even though the number of graduates and skilled staff in MINT areas in Germany has risen, demographic challenges should not be underestimated. A considerable need for replacement is to be expected in MINT areas in the coming years, as many of today's MINT skilled labourers who are gainfully employed are about to reach retirement age. On top of this, there is a substantial need for expansion as a result of structural changes. According to estimates made by the Institute of the German Economy (IW) in Cologne, the looming shortage of MINT labour in the future cannot be closed without additional measures to secure skilled labour. This applies especially to MINT skilled labour with a vocational education, where even with additional support measures the future need for skilled labour can scarcely be met. According to estimates by IW Cologne, there will be a shortage of around 67,000 MINT graduates and around 1.3 million MINT skilled workers by 2020. The significant shortage of MINT skilled labour will probably be exacerbated in the future due to the decline of MINT vocational training undergone by the cohort of 30-to-34-year-olds.⁸⁶

Laying down these requirements for initial and continuing training constitutes an important task for all persons in charge of this area. At the same time, the promotion of MINT subjects as early on as in the school system is an effective strategy to counteract declining numbers of graduates in the engineering sciences, biosciences and physics as well as the low percentages of graduates in mathematics and informatics over the long term.⁸⁷ The vocational orientation in primary and secondary schools furthermore needs to be improved and pupils informed about opportunities in technical training professions so that more talented young people develop an interest in such technical professions. The Alliance for Initial and Continuing Training, which has the objective of continuing to improve vocational training in Germany, is to be welcomed.

On top of this, measures are to be considered with the aid of which older employees can be kept working longer in life and the talents of older staff can be harnessed more effectively. Greater flexibility in pension arrangements such as, for example, an expansion of the additional income that can be earned while retaining partial pensions and in the structure of working time at business enterprises could help design working times individually. The qualifications and further training of older employees should be fostered and encouraged more in the course of lifelong learning.

An appropriate migration policy can help close structural gaps in skilled labour. Similar to Great Britain and Sweden, Germany is reaching immigration rates of inventors like this of around ten per cent, but there has been a rising trend in this area in the last two decades.⁸⁸ Immigration of highly qualified foreigners should be further eased and understood as an opportunity for Germany. Various measures that have been taken in the recent past such as, for example, the introduction of a so-called "EU blue card" (cf. also section 4.a), which allows temporary entry and stay by nationals of other countries in connection with highly qualified work in Germany, are already moving in the right direction. On top of this, the existing potential offered by foreign graduates at German universities needs to be leveraged more. The elimination of the priority review for foreign graduates of German schools of higher learning and eased requirements in the recognition of foreign degrees were important steps in this respect.⁸⁹ An expansion of the visa for university graduates seeking jobs to young foreigners willing to undergo educational training could be the next step in counteracting the decline in training in MINT occupations.

To boost the innovative capacity of Germany as a centre of business and industry, the potential of women needs to moreover be taken advantage of on a greater scale in the system of innovation. Fewer women study MINT subjects and women rarely work in the field of research and development. The percentage of women among graduates in engineering sciences in Germany is at 22 per cent in 2011 significantly below the OECD average and far behind coun-

85 Cf. e.g. Aghion und Howitt (2006) und Tsai et al. (2010) zu der Bedeutung von qualifizierten Arbeitnehmern für Innovationstätigkeit bzw. Wirtschaftswachstum.

86 Cf Anger et al. (2014).

87 Cf OECD. StatExtracts, Graduates by field of education, <http://stats.oecd.org/Index.aspx?DatasetCode=RGRADSTY>.

88 Cf EFI (2014) op. cit. diagram 25.

89 Cf EFI (2012) op. cit..

tries like Greece (40 per cent), Italy (40 per cent), Denmark (33 per cent) and Spain (31 per cent).⁹⁰ Empirical studies show, however, that enterprises with mixed teams of women and men in management positions are more successful at many different levels. Women have a significantly positive influence on innovative activity and the success of business start-ups especially in innovative enterprises.⁹¹ A greater involvement of women in the system of innovation should be pushed by eliminating stereotypes in the recruitment and selection process⁹², an improvement in the ability to combine work and family by the creation of flexible working time models and the avoidance of skewed incentives for well-trained women to exit working life. Childcare benefits for home-based care should be eliminated. At the same time, the availability of childcare possibilities in nursery schools and primary schools should be increased, as lack of childcare possibilities during regular working areas disproportionately places working women at a disadvantage. If the childcare facility closes at 4:00 p.m., in case of doubt it is the mother that is expected to pick up the child.

Innovation at schools of higher learning and non-university facilities

Public research in the field of basic research plays a key role especially in national innovation systems. National research systems are in increasing competition for ideas and talent. The international mobility of researchers and inventors improves access to leading research centres and networks. As a result, knowledge is disseminated and innovation encouraged through a combination of different pools of knowledge. At the same time, valuable knowledge can be permanently lost through emigration of scientists.

Studies on the mobility of researchers show that many top scientists leave Germany without German scientists of the same quality being persuaded to return. Although it is true that Germany is relatively successful in gaining top foreign scientists, the best ones cannot be held here over a longer

period. An important factor in international mobility of researchers is considered to be the excellence of science, while factors like better research budgets and wage differentials tend to be mentioned as only being of secondary importance.⁹³ If one wants to improve the German research system in international competition for foreign researchers, the existing strengths in the research system need to be further expanded in order to enhance international perception of such. This includes ensuring a solid financial footing. On top of this, Germany must make an active effort to attract international talent while at the same further dismantling barriers to staying in Germany.

Greater priority has to be assigned to knowledge and technology transfer activities between universities, non-university facilities and enterprises. Close collaboration between science and business has always been an advantage of the German innovation system. The strengthening and expansion of innovative clusters, which bring together technology producers and users, accelerating the joint exploration of innovative solutions, is a useful approach. Innovation clusters must at the same time be designed to be so transparent that duplications are avoided at the Federal, Länder and local government levels

Innovation policy in international competition

Investment in research and development are said to be investments in the future. Innovations can result in popular products and create new jobs. It is for this reason that enterprises and countries all over the world invest in research and development.

R&D intensity in Germany dropped to 2.85 per cent of Gross Domestic Product in 2013. This decline is in part due to a slow-down in the economy, but is especially accounted for by statistical effects.⁹⁴ The highest R&D intensities in Europe are in countries like Sweden and Switzerland, followed by

90 OECD, Stat, Graduates by field of education.

91 Cf Dezsó, C. L.; Ross, D. G. (2012): Does Female Representation in Top Management Improve Firm Performance? A Panel Data, *Strategic Management Journal*, 33 (9), p. 1072-1089, Herring, C. (2009): Does Diversity Pay? Race, Gender, and the Business Case for Diversity, *American Sociological Review*, 74 (2), pp. 208-224, Hoogendoorn, S.; Oosterbeek, H.; van Praag, M. (2013): The Impact of Gender Diversity on the Performance of Business Teams: Evidence from a Field Experiment, *Management Science*, 59 (7), p. 1514-1528, Smith, N.; Smith, V.; Verner, M. (2006): Do Women in Top Management Affect Firm Performance? A Panel Study of 2500 Danish Firms, *International Journal of Productivity and Performance Management*, 55 (7), pp. 569-593.

92 Cf Moss-Racusin, C. A.; Dovidio, J. F.; Brescoll, V. L.; Graham, M. J.; Handelsman, J. (2012): Science faculty's subtle gender biases favor male students, *Proceedings of the National Academy of Sciences*, 109(41), 16474-16479, Goldin und Rouse (2000).

93 Cf EFI (2014), op. cit.

94 Cf EFI (2015, chapter A2) for a detailed discussion of the statistical effects.

Germany and the USA. On the whole, the European countries were characterised by stagnant or decreasing R&D intensities in 2013, while countries like China registered high growth rates. Asia is led by countries like Korea and Japan.⁹⁵ The amount of global research and development accounted for by the OECD countries has plunged from 90 per cent to 70 per cent over the last ten years.⁹⁶ In order to close the gap with the leading countries for innovation, Germany should not shoot for the 3 per cent target in the future, but rather orient itself towards the R&D intensity exhibited by the group of global leaders and set its sights on a more ambitious level of 3.5 per cent of GDP for R&D.

The quickening pace of globalisation of research and development requires an innovation policy that is competitive at the international level in terms of its resources. The aim and objective must be to facilitate foreign investment in research and development (R&D) in Germany and prevent a drain of know-how.

The percentage of R&D staff in the economy accounted for by multinational enterprises in Germany has risen considerably over the past few years and amounted to 25.6 per cent in 2009 (this figure was 16.6 per cent in 1997). Foreign enterprises in manufacturing sectors like chemicals and pharmaceuticals (29.9 per cent of R&D staff accounted for by foreign enterprises) electrotechnology (28.9 per cent) and motor vehicle manufacturing (26.1 per cent) are especially active when it comes to R&D.⁹⁷ Concentration on these traditional strengths of German industry harbours the risk, however, that while existing strengths are reinforced, fields holding out promise for the future will not be adequately developed and expanded.

German enterprises are increasingly performing R&D abroad within the framework of the globalisation of research activities. According to a survey performed by the Stifterverband für die Deutsche Wissenschaft, the portion of total research expenditures spent in other countries by German enterprises rose from 27.3 per cent in 2007 to 30.5 per cent in 2011.

Foreign activities of German enterprises have surged especially in high-tech areas such as information and communication technology, medical research and biotechnology.⁹⁸ At the same time, Germany is losing especially many researchers and inventors especially in this area. These trends, which are reinforcing each other – the migration of researchers to promising areas of high technology of the future and the shift in R&D sites in search of just these top researchers on the other – offer cause for worry and could weaken Germany as a centre of innovation over the long term.⁹⁹

In order to ensure that Germany does not fall behind in new technological developments, basic research in Germany needs to be approached in a sufficiently broad manner. Additional efforts should be undertaken to reinforce R&D in the area of high technology in Germany and establish incentives for globally operating enterprises to invest in Germany. The establishment of new R&D centres and the consolidation of already existing sites of domestic and foreign enterprises will be decisive in safeguarding Germany's innovative capabilities.¹⁰⁰

The factors that play an important role for multinational enterprises in deciding where to locate R&D sites internationally are generally economic criteria such as access to new markets, technologies, researchers and proximity to companies and institutions.¹⁰¹ Important innovation-policy factors in deciding on where to locate R&D furthermore include targeted measures to attract industry, national arrangements regarding patent protection and tax arrangements. There are different strategies for promoting R&D in most OECD countries. At the forefront of German innovation policy are targeted promotional programmes (see the following section). In other countries the focus is on tax-related measures. These include expenditure-based incentive systems such as tax credits (e.g. in France, Norway and the USA) and non-taxable amounts (in Denmark, Finland and Austria, for example), accelerated depreciation opportunities (for instance in Canada, Denmark and Poland) or SME-specific R&D tax incentives (e.g. Canada, France and

95 Cf EFI (2015), op. cit.

96 Cf OECD (2014a).

97 Cf EFI (2013); IWH/DIW/LMU/WU (2013).

98 Cf Stifterverband für die deutsche Wissenschaft (2013).

99 Cf EFI (2014), op. cit.

100 Cf EFI (2014), op. cit.

101 Cf OECD (2011).

Norway).¹⁰² No tax incentives have been offered for R&D expenditures in Germany to date. Because tax incentives generally influence capabilities for innovation,¹⁰³ domestic enterprises might face a competitive disadvantage for this reason. If the establishment of financing neutrality in corporate taxation is not contemplated in the form of an interest adjustment on capital stock (see section 4.B), the introduction of tax support for R&D should be reviewed. By the same token, all forms of tax encouragement of research should not serve as a substitution for already existing promotional instruments, but rather designed to be complementary.

Financing of innovative enterprises

Sufficient access to external financing is absolutely essential to the innovative capabilities of business enterprises. Limits on financing could for this reason have a significantly negative impact on the innovative capabilities of enterprises.¹⁰⁴ In particular, equity financing in comparison to the use of debt capital is considered to be especially beneficial to the financing of innovative enterprises in industrialised countries.¹⁰⁵ In Germany equity financing is used relatively little both by private as well as institutional investors. The German capital market is on the whole rather small by international comparison.

One reason for the limited importance of equity financing in Germany is the lower attractiveness of this for major institutional investors in Germany under existing conditions. As a result of the restrictive regulatory requirements that exist, such as those for insurance companies, for instance, which are not only supposed to earn a guarantee return¹⁰⁶, but also have to make sure that they have a balanced risk-return profile in the best interest of beneficiaries, a significant growth in equity capital cannot be expected over the short term, either. This makes it all the more

important to better leverage capacities and strengthen the market for equity financing.

A special form of equity financing is venture capital, which is an important source of financing especially for innovative new high-tech enterprises. In comparison to the USA and European countries like Sweden, Finland or Ireland, the market for venture capital investment in Germany is underdeveloped, however.¹⁰⁷

Promotional programmes like “INVEST – grant for venture capital” and the recently resolved tax exemption for these grants are an important step in directly encouraging venture capital.¹⁰⁸ The establishment of a fund with a volume of EUR 500 million being contemplated by the Federal Government jointly with the European Investment Fund (EIF) to finance the growth of German start-up businesses could go some way in compensating for the insufficient scale and investment power of funds operating in Germany and is therefore to be welcomed.

Given the paucity of institutional investors, an internationally competitive design of legal and tax-related framework conditions for risk capital is of key importance in Germany in order to promote venture capital investment from Germany and abroad in German start-up enterprises (cf. section 5.C). Value-added tax charged in Germany on remuneration for fund management is not competitive in European comparison, for example. The legal security of structured funds that are transparent in taxation terms should be improved by a statutory arrangement.

Insurance companies and utilities are important institutional investors in Germany, but these can only invest in venture capital funds to a very limited extent. The capital market and supervisory legal environment must be rendered more attractive in order to avoid scaring off potential institutional investors with a corset of regulations. Impor-

102 For an international comparison of tax promotion of R&D, cf OECD (2014), op. cit.

103 Cf DIHK (2012).

104 Cf Gorodnichenko und Schnitzer (2013).

105 Cf Hsu et al. (2014).

106 The maximum actuarial interest rate allowed since 1 January 2015 is 1.25 per cent. “Act Securing Stable and Fair Payments for Persons Holding Life Insurance Policies (“Gesetz zur Absicherung stabiler und fairer Leistungen für Lebensversicherte (Lebensversicherungsreformgesetz – LVRG)”, Federal Gazette for 2014 part I no. 38.

107 The share of venture capital investment in GDP was 0.17 per cent in the USA in 2013, 0.07 per cent in Finland and Ireland, 0.06 in Sweden and 0.03 per cent in Germany (Cf OECD, 2014c).

108 The “INVEST – Grant for Venture Capital” programme encourages investment by Business Angels. 20 per cent of an equity investment is reimbursed (a maximum of EUR 250,000) if Business Angels invest at least EUR 10,000 in an innovative new company and they hold their stake for at least three years.

tant groups of investors are discouraged from making capital through Basel III, Solvency II or the AIFM Directive. Additional restrictions on investment opportunities should be avoided in future changes of laws and regulations.¹⁰⁹

The restrictive treatment of loss carry-forwards at present in company acquisitions also reduces the incentives of providers of venture capital to invest in German business start-ups. The introduction of general taxation of profits from divestitures in the case of free-flow shares in incorporated companies under discussion¹¹⁰ or in increase in taxation of remuneration for fund initiators would also be similarly harmful.¹¹¹

Future changes in laws and regulations should therefore always be instituted with an eye on possible indirect negative effects on venture capital. A comprehensive revision of legislation in the form of a venture capital law with the objective of improving the framework conditions for venture capital in Germany constitutes a necessary step in strengthening the venture capital market in Germany in a sustainable manner. In improving the framework conditions for venture capital investment, it should be ensured, however, that these encourage a long-term focus and commitment on the part of investors.

One key deficit with equity financing, however, is especially that the German tax system treats it much less favourably than other forms of financing. Investments that are financed

with external, i.e. newly raised equity, are subject to a greater tax burden than self-financed or debt-financed investments (see Table 4-1). This financing is especially important for newly founded and younger companies. Established enterprises, on the other hand, often have the possibility to make use of retained profits, which is why their investment activity is less negatively affected. This can be viewed as one of the causes underlying the low level of business start-up activities in Germany because it raises the profitability of investment projects in newer companies compared to established, already-existing companies.

The lowest tax burden, on the other hand, is on debt financing, which means that the current tax system offers an incentive for more debt and against more equity.¹¹² This incentive applies equally to financial as well as non-financial enterprises. That is why a tax system that is neutral towards financing could support the required strengthening of equity capital resources of banks and make a contribution to the resilience of the financial sector to crises.

Tax treatment of equity capital at present leads to a distortion of competition at the expense of newly founded, rapidly growing companies, which are above all dependent on injections of new equity by external investors and only have limited access to debt financing in comparison to established enterprises.¹¹³ Equal treatment of debt and equity financing through the introduction of a deduction

Table 4-1: Tax burden on self-financing and debt financing at companies – the legal situation in 2013

	incorporated companies	unincorporated companies
Equity financing	48.3 %	47.4 %
Self-financing	29.8 %	47.4 % (without § 34a Income Tax Act (EStG))
Debt financing	29.8 %	26.4 %

109 Federal Association of German Industries (BDI – Bundesverband der Deutschen Industrie e.V. (2014): BDI Fokus Finanzmarkt, July 2014, Berlin: BDI.

110 Called for e.g. within the framework of the Bundesrat initiative “closing tax loopholes – eliminating tax breaks – stimulating investment” (Cf Hessian Ministry of Finance, 2014)

111 Called for in the draft act of the Bundesrat “Draft Act for the Further Simplification of Tax Law (“Entwurf eines Gesetzes zur weiteren Vereinfachung des Steuerrechts 2013 - StVereinfG 2013);” <http://www.bundesrat.de/SharedDocs/beratungsvorgaenge/2014/0001-0100/0092-14.html>. (last call-up on 8 March 2015).

112 The influence of taxation on debt financing ratios has been demonstrated in a comprehensive manner by empirical studies such as, for instance, in the meta analysis by Feld et al. (2013). Kestens et al. (2012) and Princen (2012) analyse the transition to a taxation of business enterprises in Belgium that is neutral towards financing by means of an interest adjustment and report significant reductions in debt financing. In a simulation model for Germany, Büttner et al. (2012) moreover show that a transition to taxation that is neutral towards financing would have a positive impact on investment activities in Germany. In a microsimulation model for Germany that comes very close to the proposal by the Council of Experts, Finke et al. (2014) calculate for the interest adjustment on capital stock that reform in Germany that would even be neutral in terms of revenue would lead to a long-term 5.5 per cent increase in capital stock. Cf pursuant hereto the annual expertise for 2012-2013, Council of Experts, pursuant to an assessment of overall economic development.

113 Cf Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2012).

possibility for imputed interest would ensure financing neutrality between equity and debt capital financing, in this manner helping to reduce the distortion at the expense of company start-ups and growth of new companies and their investment activities.¹¹⁴ The Expert Commission therefore proposes review of the proposal described in the box below, which has the objective of designing the taxation of business enterprises to be neutral in terms of financing and at the same time leave specific unique aspects for Germany's corporate taxation system (in particular business tax) largely unaffected. The reform may moreover be implemented in a relatively simple manner.

In designing the reform, it must be ensured that the financial resources of municipalities, which are especially important with respect to public-sector investment activities, remain completely intact. It is therefore advisable to design the reform to be neutral with regard to revenue and for any losses of income at the local community level to be compensated. At the same time, it should be ensured that the expected positive impact on business enterprises is not negated in the course of possible counter-financing. Beyond this, fiscal risks could also be kept low by not rendering an excessive amount of changes and implementing the reform step by step

Financing of innovative companies: implementation possibilities

The proposal by the Expert Commission on the attainment of financing neutrality specifically provides for the retention of withholding tax on interest and dividends unchanged and leaving the business tax largely unchanged. The taxation of real estate assets could remain in the present form. The reform would therefore basically only involve taxation of incorporated enterprises and unincorporated enterprises. Changes having a minor impact would be necessary in the event of taxation on returns on private capital.

Interest adjustment for incorporated enterprises and unincorporated enterprises

At the heart of the reform is the introduction of an imputed interest deduction for incorporated companies reducing income subject to corporate tax. This would eliminate the current double burden on equity financing that comes about through two-stage taxation (corporate profits subject to taxation followed by taxation of dividends). The interest deduction is determined using an interest rate stipulated by statute (cf. below for the level of this interest rate), which is multiplied by the capital stock eligible for adjustment. The capital stock refers to the part of equity which has not come about through retained profits and is hence only the entire equity injected from outside the company. The capital stock must then be reduced by the shares held in other incorporated companies in order to avoid double-counting of capital. This deduction has an impact on business tax as a result of the deduction of imputed interest in determining earnings subject to corporate tax. This does not mean a complete tax exemption, however. Instead, earnings continue to be subject to taxation on dividends when they are distributed. Ultimately this thus results in withholding tax being imposed on imputed interest.

This proposal provides for a tax being imposed on incorporated companies and unincorporated companies that is almost identical. Transparent taxation is maintained for unincorporated companies, however. For this reason another type of taxation procedure is needed which can be implemented in the form of profit-splitting. A profit share in the amount of imputed interest on equity would be subject to the withholding tax rate. The remaining profit would then be subject to the progressive income tax table. Analogously to interest adjustment in the case of incorporated companies, a reduction in equity by the share assets held in other enterprises would be necessary. The partial income procedure that is currently to be applied to unincorporated companies would therefore have to be discarded. In addition, the tax break on unremoved profit (§ 34 a of the German Income Tax Act (EStG)) would remain in an expanded, adjusted form.



¹¹⁴ A detailed discussion and analysis of the impact of this tax instrument is contained in the annual assessment 2012/2013 of the Council of Experts pursuant to an assessment of overall economic development. The LSE Growth Commission also calls for promotion of equal tax treatment of equity and debt capital investments surrounding private investment and innovation in Great Britain in its expertise "Investing for Prosperity – Skills, Infrastructure and Innovation".

The coexistence of transparent taxation of unincorporated companies and the separation principle in the case of incorporated companies (separate taxation at the company level and the level of the shareholder) would be maintained under the proposed reform. Unincorporated companies thus lack a tax charge that is equivalent to the taxation on dividends of incorporated companies. In principle, profits of unincorporated companies will therefore be treated as if they had been distributed. The tax charged on imputed interest with the withholding tax rate is to be understood as the counterpart to taxation on dividends of incorporated companies (company level and level of the shareholder). With normal business tax rates, the tax burden on unincorporated companies is somewhat lower than for incorporated companies, however. This is due to the intended maintenance of the current tax rates and hence already applies at present.

It makes sense to supplement this by maintaining the current special arrangement through the “tax break on unremoved profits” for unincorporated companies (§ 34a of the German Income Tax Act) in adjusted form. In this manner, it could also be made possible for unincorporated companies to incur a (temporarily) lower tax burden in the case of internal financing.

Amount of the imputed interest rate

Assuming an ideal corporate tax, the adjustment interest rate should be set at the level of the uniform market interest rate without any risk. The ideal level of the adjustment interest rate can in fact only be approximated because this uniform market interest rate does not exist. The condition for linkage to interest without risk, however, would be that there is an immediate and complete compensation for losses. If losses have to be carried forward and these are not taken into account for tax purposes in the event of an enterprise becoming insolvent, as is the arrangement at present in Germany, a certain risk mark-up would be justified.

Besides this, the adjustment interest rate would not stay constant over several years – it must be adjusted, rather, to conform to market developments. It is important in this regard that an adjustment be based on rules. One useful principle that could be applied to determination of the adjustment interest rate would be the interest rates which companies and banks agree upon for new loans. A suitable data series for determining the adjustment interest rate would be the average effective interest rate for short-term loans or loans subject to variable interest charges to enterprises in amounts of more than EUR 1 million. Solely focusing on major loans keeps the impact of the processing fees that are included implicitly in the effective interest rate low. This data series is published by the Deutsche Bundesbank on a monthly basis and maps developments in market interest. Thus this interest rate was 1.8 per cent in April 2014. Interest rates of more than 5 per cent applied on annual average in the years 2007 and 2008.

Losses in tax revenue

The Council of Experts has submitted a detailed estimate of the reduction in tax revenue associated with such a reform. Assuming an adjustment interest rate of 3 per cent, tax revenue would probably be around EUR 4.6 billion less (including EUR 930 million less from business tax). At an interest rate of 3 per cent, a normalisation of the interest rate level is taken into account. This estimate does not take into account adjustments in behaviour, which tend to counteract this, increasing tax revenue. Approximately EUR 1.8 billion would accrue in the area of taxation of private capital earnings and unincorporated companies. Incorporated companies would as a result be relieved to a tune of approximately EUR 2.8 billion. With regard to tax revenue from corporate and business tax on incorporated companies, there would be an approximately 6 per cent reduction in the average tax burden.

As a result of some data that is not available, there is some uncertainty regarding this estimate. This could be easily confronted, however, by continuously raising the adjustment interest rate to the intended level over a period of several years. The low interest levels at present offer excellent underlying conditions to get started with interest adjustment.

Promotional measures for innovation

A wide variety of promotional measures are used in Germany to foster innovation. These include, for example, the Central Innovation Programme for SMEs (ZIM), a national promotional programme open to all technologies and sectors aimed at encouraging small and medium-scale enterprises. The EXIST programme is tailored to the promotion of business start-ups in the field of science. Peak cluster competition is aimed at supporting the most efficient cluster and transforming regional innovation potential into permanent value-creation. The aforementioned “INVEST – grants for venture capital” promotes equity financing at new companies. The high-tech start-up finances technology start-ups in the capacity of an early-phase investor.

The effectiveness and efficiency of promotional measures cannot be quantified in lieu of systematic analysis, however, as there are a variety of interactions between factors, while the impact of promotion often only becomes tangible after a certain time delay. Such a systematic analysis of impact by promotional measures that not only have an impact over the short, but also the medium and long term, is lacking at present, however.

One possibility for confronting the uncertainty over the effectiveness of various promotional measures is to be found in an experimental approach (*randomised controlled trials*), with the aid of which the impact of new instruments can be tested. Smaller pilot projects are carried out in advance in this strategy and the participants randomly assigned to promotion or non-promotion. Such random assignment has the effect of ensuring that the groups cannot be systematically distinguished from one another, i.e. they are with a high level of certainty statistically identical with one another in all observable and non-observable characteristics with the exception of the trait “promoted” or “not promoted”. If after the completion of the promotional measure innovation activity in both groups differs, this difference may indeed be attributed to the promotional measures and not to other differences between the two groups.¹¹⁵ Analyses of impact can be conducted in advance with the aid of such pilot projects and causal effects determined in order to in this manner identify the best and most effective measures in the run-up to actual launch of the

respective promotional programme. This experimental approach offers the opportunity of developing more efficacious and at the same time more cost-effective promotional measures. A similar strategy is to be found in the randomised award of resources followed by an evaluation, which especially makes sense with respect to promotional measures in which there are a large number of applicants for a limited budget.¹¹⁶

This evaluation procedure has been used too rarely in Germany to date in comparison with other countries.¹¹⁷ The introduction of modern evaluation procedures for promotional measures is urgently warranted in order to ensure the efficacy of policy measures and ensure that public resources are awarded in an efficient manner. A positive example that can be cited here is the Innovation Growth Lab, a global institute for innovation and growth policy in which researchers work together with private and public-sector organisations to develop and test new methods for promoting innovative activities and innovative enterprises.

Societal acceptance

Processes of innovation are inherently associated with risks. How conducive the underlying conditions in a society are to innovation also depends not least on whether there is a societal acceptance of innovation and the risks associated therewith. The risks of innovation often stand at the forefront in the societal debate without the potential offered by such being adequately taken into account. Companies therefore face the important communication task of informing people about the risks, but also the potential of innovations if they want to maintain or gain societal acceptance for their innovative activities. The policy-making area is also called upon in weighing out the opportunities and the risks that emanate from innovations. It should keep an eye not only on potential risks, but also the consequences of innovation in the legislative process. One possibility of firmly establishing this in the legislative process would be the innovation principle, which is called for in the open letter by the European Risk Forum to the President of the EU Commission, Jean-Claude Juncker.¹¹⁸ This provides for the impact of a (regulatory) project on the innovation atmosphere to be studied and addressed every time there are changes in laws and regulations.

115 Cf EFI (2013), op. cit.

116 A detailed description and discussion of such evaluation methods can be found in Kugler et al. (2014). For a discussion of the role of experiments in innovation policy, Cf OECD (2014b). Cf also Innovation Growth Lab.

117 A summary of the use of this evaluation method in other countries is provided in Boockmann et al. (2014).

118 Cf Risikoforum.

Recommendations for action

Promotion of qualified skilled labour. Qualified skilled labour constitutes an additional important framework condition for the long-term innovative capabilities of Germany. In order to counteract shortages of skilled labour in MINT areas in a sustainable manner, the promotion of MINT subjects already in primary and secondary school is required. At the same time, measures should be pursued with the aid of which older employees can be kept in employment longer and the talents of older staff can be better used. Immigration of highly qualified foreigners should be facilitated and understood as an opportunity for Germany. A special effort should be made to boost the involvement of women in the innovation system. This includes the elimination of stereotypes in the recruiting and selection process, but also the avoidance of skewed incentives for well-trained women to leave working life. Childcare benefits for home-based care should be eliminated and the resources saved invested in the promotion of all-day childcare.

Continue to expand existing strengths of the research system. The accelerating globalisation of research and development requires an internationally competitive innovation policy. This must have the aim and objective of facilitating foreign investment in R&D in Germany and preventing the drain of know-how. Existing strengths in the research system need to be further expanded in order to improve the German research system in international competition for foreign researchers. Efforts should be redoubled to reinforce R&D in the area of high technology in Germany and establish incentives for globally operating enterprises to invest in this field in Germany. The introduction of tax-related promotion of R&D should be contemplated to create internationally competitive framework conditions for the R&D activities of enterprises.

Evaluation of innovation-policy promotional measures. The introduction of modern evaluation procedures is urgently warranted, especially for innovation-policy promotional measures in order to ensure efficacy and to structure the award of public-sector funds in an effective manner.

Designing innovative policy in an active manner. An important challenge for successful innovation policy is to recognise and tackle key topics for the future early on. In order to push forward innovation in important fields for the future – such as, for example, with a view to the digital economy and society – and to maintain the competitiveness of Germany as a centre of innovation over the long term, an active innovation policy is required. Innovation policy must by the same token be designed in such a manner as to complement competition policy and foster innovation.¹¹⁹

Stronger incentives for equity financing. One important framework condition for the innovation activities of enterprises is sufficient access to external equity financing. An internationally competitive design of the underlying legal and tax conditions for venture capital for this reason creates incentives for private investment. This includes a more attractive capital market and supervisory law environment in order to avoid restricting potential institutional investors through a corset of regulations. This also above all means, however, finding a way of taxing capital in which debt capital does not benefit significantly more than equity capital financing, as is the case at present. One possible strategy for this would be tax deduction of imputed interest on equity.

119 Cf Aghion et al., 2011.

5. Private infrastructure

5.A. Digital infrastructure

The break-neck speed of developments in the area of information and communication technologies (ICT) is putting its stamp on business and the economy. When the Internet began to commercialise at the latest, new products and services that are based on the availability of efficient telecommunications networks began to develop on a continuous basis and at an unparalleled speed. At present the development of applications is concentrating on the networking of data and knowledge so that information can be independently evaluated and processed by computers (big data, machine learning). At the same time, the networking of smart applications and the further development of systems are being pushed forward (*Industrie 4.0, Internet of Things, Smart Home, Smart Meter, Smart Grid und Smart Mobility*).

Digital infrastructure is thus to be understood at different levels.¹²⁰ At the first level, high-performance broadband networks and efficient computer centres form the basic infrastructure for data transport, storage and processing. At the second level are digitised infrastructures such as, for example, in the fields of education, energy, traffic and administration, whose structures are being increasingly changed by the accelerating digitation of processes and services. Finally, new applications, business models and technologies are coming about at the third level.

With a view to the strategic relevance of ICT for the success of companies, 83.6 per cent of persons in charge of ICT at business enterprises stated in a study that the importance of ICT would continue to grow in the next five years.¹²¹ For this reason, the general availability of efficient and secure broadband networks is assigned a key role as basic infrastructure for digitised infrastructures and downstream innovation or new business models.

Germany thus faces the important challenge of creating competitive digital infrastructures. In order to make possible a successful development at the second and third levels, investment needs to be reinforced at the level of broadband networks. Data available on the status of broadband networks confirms the impression one gains reading the media that the availability and speed of this infrastructure in Germany is lagging behind in comparison to other countries

and – if investments are not made in the infrastructure – the digital divide relative to competitors in the industrialised countries will widen. If the digital divide indeed grows, this would have an irreversible impact on the development of the economy and society in Germany and Europe.

Accelerating digitisation and the declining ratio of investment in the overall German economy raise the question of whether and in what fields of technology the public sector can support the expansion of digital network infrastructures. It was against this background that the Expert Commission analysed in detail economic policy challenges facing the digital network infrastructure.

The need for investment in digital infrastructure

Increasing volumes of data require investment in broadband networks

Technical progress in computer technology as well as the possibility to exchange information via the Internet have led to a massive increase in data traffic since the beginning of the 1990s. Novel new terminal devices and applications enable digital penetration of almost all areas of life. As a result, the volume of data will continue to soar and hence place further demands on the network infrastructure.¹²²

The dramatic surge in the volume of data is closely associated with demand for fast broadband networks. The quantity of data transmitted per unit of time, so-called bandwidth, is for the most part dependent on the type of transmission technology used. The maximum transmission rate of an analogue modem, for example, is 56 Kbit/s. By comparison, already up to 100 Mbit/s can be transmitted by modern VDSL technology. The notion of broadband technology in particular designates especially fast transmission technologies, whereby the transmission of data can take place via cable by fibre optic (FTTH/B) or copper lines (xDSL and cable connection) or by wireless. While bandwidths of between one to six Mbit/s are required for surfing in the Internet, the demands placed on bandwidth and hence the maximum transmission capacities of networks rise with the data intensity of the application. Inter-

120 Cf on this BITKOM, IT-Strategie – Digitale Agenda für Deutschland, 2014, pp. 30 pp.

121 Kretschmer, Tobias; Bolliger, Kerstin; Koob, Clemens (2010), Studie LIFE 2 Vernetztes Arbeiten, Online: <http://www.studie-life.de/wp-content/uploads/2011/11/Life-2-Vernetztes-Arbeiten.pdf>

122 Cf on the Cisco (2014), The Zettabyte Era—Trends and Analysis.

net-based television (IPTV), for instance, already requires bandwidths of between six and 50 Mbit/s.¹²³

Broadband networks' level of development in Germany

As a result of the growing data intensity of applications, experts agree that fibre optic lines and the next generation of mobile telecommunications connections will play a key role over the medium to long term in satisfying future communication flows. Most data communication takes place through fibre optic lines already at present. Other broadband technologies such as xDSL, cable or wireless are merely used in the end-customer segment, i.e. the connection of households and businesses to the fibre optic network of telecommunications companies (the so-called "last mile").

Table 5-1 shows that the usage of powerful, efficient fibre optic connections in Germany, which averages 0.6 per cent of all cable-based broadband technologies, is relatively low by international comparison. While the share of fibre optic connections as a percentage of all broadband technologies is below the OECD average (13.8 per cent) in Germany (0.6 per cent) and the USA (6.7 per cent), significantly higher levels have been achieved by Japan (69.2 per cent) and South Korea (63.7 per cent) thanks to industrial-policy activities of the governments of these countries.¹²⁴

In addition to financial aspects (tariff policy and network providers), it is probably technical availability that plays a

crucial role in the low level of diffusion of fibre optic connections in Germany. According to data from the European Commission, barely 2.6 per cent of German households were able to request fibre optic connections from their telecommunications providers in 2012. By comparison, 12.4 per cent of households were able to be directly supplied with a fibre optic connection in the EU on average. As the result of the dearth of fibre optic connections, the broadband supply in Germany is mainly via xDSL technology (averaging 86 per cent), with the remaining 13.3 per cent being accounted for by cable connections and 0.6 per cent other broadband technologies.

Looking at the availability of broadband connections across all available technologies, a recent study by TÜV Rheinland¹²⁵ shows that cable-linked broadband connections with a bandwidth of six Mbit/s or more on the downloading side already had an availability of 85 per cent for households. By comparison, coverage in the area of 16 Mbit/s or more on the downloading side was still 75 per cent, although only 58 per cent of households had the possibility of connections with speeds of at least 50 Mbit/s on the downloading side. The divide between eastern and western Germany on the one hand and urban and rural regions on the other is interesting. On average more than 65 per cent of western German households have been able to request broadband of 50 Mbit/s or more on the downloading side, whereas barely 30 per cent of eastern German households were able to ask for bandwidth on this scale.¹²⁶ Turning to the supply situation comparing urban and rural areas in the area of at least two Mbit/s in downloading, the ratio is still relatively balanced at 99.6 per cent versus 92.8 per cent. The avail-

Table 5-1: Share of fibre optic connections as a percentage of all broadband connections

as a per cent	2009	2010	2011	2012	2013	mean value 2009–2013
Germany	0.5	0.5	0.6	0.7	0.9	0.6
Japan	54.4	56.9	61.8	65.9	69.2	62.4
South Korea	48.8	53.7	57.4	60.4	63.7	57.7
USA	5.1	5.8	6.6	7.3	8.0	6.7
OECD	11.2	12.2	13.4	14.6	16.2	13.8

Source: own estimates; OECD Telecommunications and Internet Statistics.

123 Cf Brauckmüller, T. (2013).

124 Cf Gerpott, T. (2014), p. 10.

125 Cf TÜV Rheinland (2013a), Bericht zum Breitbandatlas Mitte 2013 im Auftrag des Bundesministeriums für Wirtschaft und Technologie (BMWi), Online: <http://www.bmwi.de/Dateien/BBA/PDF/breitbandatlas-bericht-mitte-2013-teil-1.property=pdf,bereich=bmwi2012,sprache=de,rwb=true.pdf> (last call-up: 26 January 2015).

126 This value relates to the simple average of bandwidth available in the German Länder not including Berlin. The data has been taken from the report by TÜV Rheinland (2013a).

ability of connections for urban households with at least 50 Mbit/s on the downloading side is already at 78.5 per cent, but the figure for rural households is only 13.8 per cent.¹²⁷

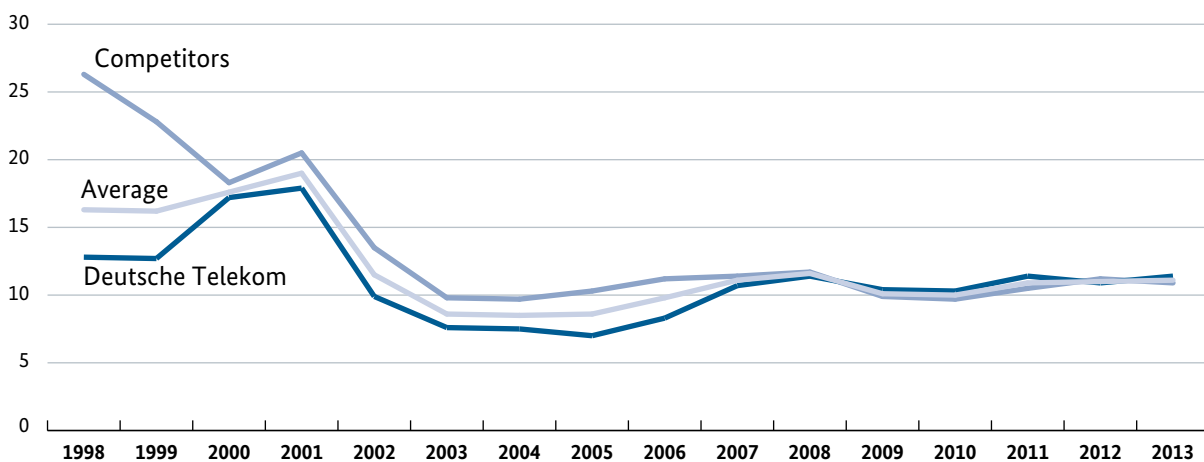
The significantly lower bandwidth available in rural areas is inter alia due to the fact that broad sections of the population and numerous small and medium-scale enterprises do not have any access to modern broadband technologies like fibre optic, VDSL, cable or wireless technologies. According to data from the Federal Statistics Office, about 89 per cent of enterprises and facilities of self-employed persons were connected to the Internet in 2014, 92 per cent of which had a broadband connection. A closer look reveals a considerable discrepancy in speeds actually available, however: while 46 per cent of these businesses have a bandwidth of up to 10 Mbit/s, barely 7 per cent profit from 100 Mbit/s and more.¹²⁸ In other countries with a high-speed fibre optic infrastructure, it would appear that the linkage of business enterprises with high-speed broadband connections spills over to innovative applications and additional investment.

Investment behaviour in broadband networks

In order to confront demand for ever more broadband and enable users to use data-intensive applications without restriction, broadband providers have to invest in new transitional technologies on an ongoing basis. In spite of the privatisation of telecommunications networks on 1 January 1998, Deutsche Telekom continues to dominate the market for telecommunications services with 44 per cent of sales in 2013. The remaining 56 per cent of services are split up between nationally operating competitors like 1&1, Telefonica O2 or Vodafone as well as more than 100 small and medium-scale enterprises at the regional and local level, some of them with stakes held by municipalities.¹²⁹

According to data from the Federal Network Agency, more than EUR 112 billion was invested in line-based telecommunications infrastructure between 1998 and 2013. With a market share of 85 per cent of the infrastructural connection market, Deutsche Telekom dominated large parts of the value-creation chain. In spite of the clear dominance of Deutsche Telekom, Figure 5-1 shows that the investment rates of Deutsche Telekom and competitors have largely

Figure 5-1: Investment as a percentage of sales



Source: own diagram; data from the Federal Network Agency (2013); Federal Network Agency (2009).

127 The study by TÜV Rheinland (2013a) uses a threefold categorisation in its estimates: urban, semi-urban and rural.

128 Cf Statistisches Bundesamt (2014).

129 Cf WIK Consult (2013).

converged. This trend is due to the fact that a considerable number of competitors have been investing in the establishment and expansion of their own networks for years. These investments have a positive impact on downstream investment by companies using their networks.

Aside from some fluctuations, the absolute volume of investment remained relatively constant between 1998 and 2013, averaging EUR 7 billion. By comparison, the ratio of investment to sales dropped from 16.3 per cent to 11.1 per cent, while the overall economic investment ratio slipped from 0.4 per cent to 0.2 per cent of national income. The high investment ratios between 1998 and 2002 are for the most part due to investment by competitors in the course of market liberalisation. The volume of investment has been relatively constant at EUR 6 billion or an investment ratio of ten per cent of sales since 2002, as can be seen in Figure 5-2.

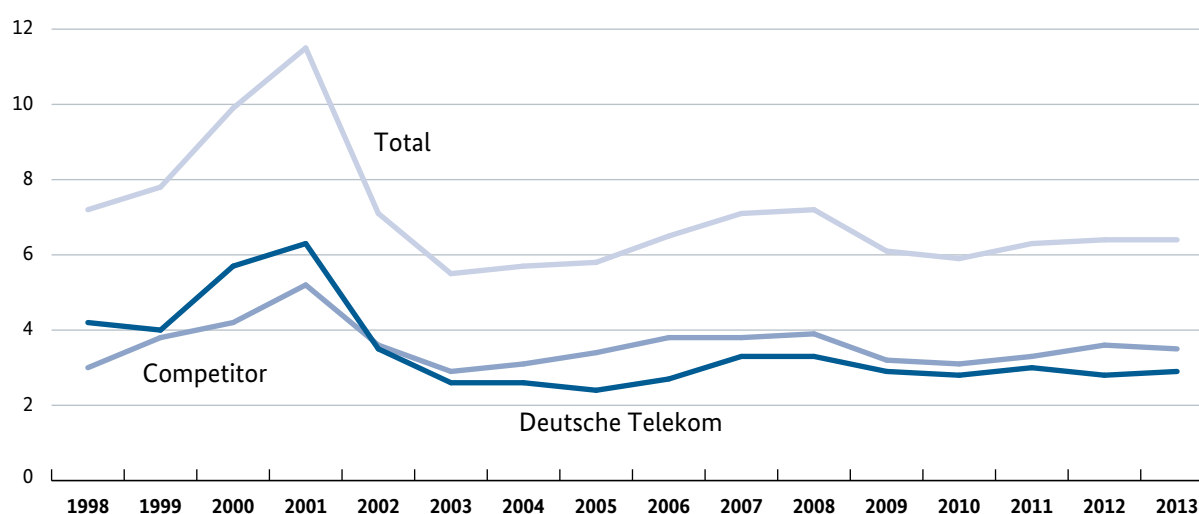
Data from the OECD indicates that Germany is not among the most investment-intensive OECD countries in the area of broadband, either with regard to the overall economic investment rate as well as the share of gross investment in fixed assets. Especially salient is the gap to Japan, South Korea and the USA: While in 2011 per capita investment in broadband networks was USD 225 in the USA, USD 145 in Japan and USD 139 in South Korea, the German telecommunications industry invested USD 102, i.e. less than half of the amount for the US, in the expansion of the network infrastructure.

Recommendations for action: boosting investment in digital infrastructure

The importance of digital infrastructure of Germany

In order for the knowledge-intensive and capital-intensive German economy to remain competitive in the future as well and be able to maintain or even expand its position in global markets, public and private actors have to invest in the modernisation of the stock of systems and facilities and with it the future viability of Germany as a centre of business and industry. The digital infrastructure constitutes a key field of investment in safeguarding competitiveness. First of all, high-speed, secure broadband networks and computer centres provide the foundation for the development and marketing of new products and services. This is because digitised goods can only be consumed or used without any qualitative restrictions¹³⁰ if the bandwidth meets user demands. Secondly, smart networking and thus digitisation of the traditional infrastructures of education, energy, health, traffic and administration form the foundations for growth and employment. In particular, the central linkage between the digital world and physical world of industry is established here.

Figure 5-2: Investment in telecommunications networks in billions of Euros



Source: Own diagram; data from the Federal Network Agency (2013); Federal Network Agency (2009)

¹³⁰ IPTV in HD quality, multiple video streaming, remote maintenance and control of machines and systems, telemedicine, rapid synchronisation of large quantities of data, including between mobile devices and the Cloud, rapid downloading of large quantities of data.

The need to review expansion targets for digital infrastructure

As a result of the below-average supply of broadband, in 2012 the Federal Government set the goal of making possible blanket availability of broadband networks with a transmission speed of at least 50 Mbit/s in downloading by 2018. It is not absolutely necessary for fibre optic connections to be expanded throughout Germany in order to reach this objective. Instead, the target of the Federal Government can be attained solely by the expansion of VDSL and cable connections or in combination with wireless technologies. These technologies make bandwidths of 50 Mbit/s and more in downloading possible already today.

Based on the expansion target by 2018, TÜV Rheinland¹³¹ projects that broadband expansion throughout Germany with speeds of at least 50 Mbit/s in downloading using all line-based technologies will cost around EUR 34 billion and hence significantly less than the EUR 69 to 94 billion that would be required if fibre optic was expanded to offer blanket coverage nationally (not including internal building cable connection). Because at present there are still relatively few applications (IPTV in HD quality, multiple video streaming, remote maintenance and steering of machines and facilities, telemedicine) that require bandwidths of at least 50 Mbit/s on the downloading side, the expansion target of the Federal Government set in 2012 would at first glance appear plausible and to be welcomed at present as well.

It must be assumed, however, that new terminal devices and growing usage demands will lead to the development and ultimately the use of more data-intensive applications. Experience also shows that high-speed broadband connections need to be in place for new applications to be developed at companies and additional investment generated. TNS-Infratest projects demands on broadband to surge to at least 100 Mbit/s within five to ten years.¹³²

It therefore makes good sense already at present to think about an infrastructure that makes use of fibre optic cable on a greater scale than that planned to date in order to meet these demands on the horizon. A new round of investment in fibre optic cable later on, which may possibly

only appear warranted in a few years' time, could thus be anticipated now.

The development of products and services and the application of tools for this purpose will take place throughout the world in those places where the infrastructure is excellent. An outstanding digital infrastructure for this reason constitutes a necessary condition for Germany's future competitiveness. It would appear, however, that the expansion targets that have been set so far cannot be achieved by private investment alone. This financing problem would be further exacerbated by an ambitious expansion target.

Need for review of regulation to date

Based on the observation that broadband networks constitute natural monopolies, regulation to date has concentrated on non-discriminatory network access for competitors and requirements applying to the provision of upstream services. These tools and instruments are meant to make competition possible in the existing network. The fact that this objective has been achieved and that existing regulation is successful is indicated by the high and still-growing market shares of competitors of Deutsche Telekom, as can be seen in Figure 5-3.

With regard to the establishment and expansion of new infrastructures, the question arises as to whether the approach opted for down to the present is capable of inducing investment on a scale that is efficient in macro-economic terms, as the declining sales of telecommunications enterprises as well as high investment costs for the laying of fibre optic cables offer cause for considerable scepticism as to whether market players will invest on a major scale in sophisticated infrastructures, especially in bringing about blanket national coverage for fibre optic connections, over the short and medium term.

The Expert Commission is therefore in favour of an improvement in the framework conditions for investment in digital infrastructure. This includes an adjustment in the current regulation while preserving the function of ensuring competition, which can create new incentives for investment on the part of providers. Various options for an

131 Cf TÜV Rheinland (2013b).

132 Cf IT-Planungsrat (2013), p. 28p.

adjustment of regulation are examined in the following. The Expert Commission also suggests a thorough review be performed on ways to attract additional investors in addition to municipalities and established telecommunications companies.

a. Financing through the award of (subsidised) concessions

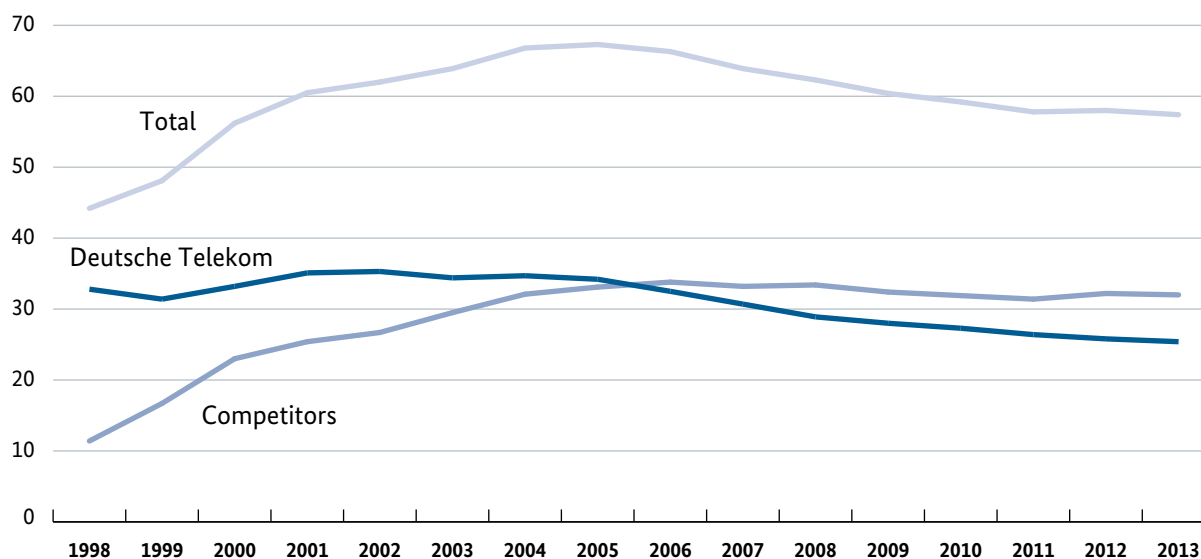
Fibreglass networks constitute natural monopolies. With regard to decisions by business enterprises to invest in these, the question therefore arises as to how an efficient coordination of investment in the establishment and expansion of regional networks can be reached. Possible solutions include government intervention, in which for example concessions are awarded for the supply of specified territories.¹³³ Awards can at the same time be based on tenders and provide for government subsidies, whereby the latter can substitute for possible exceptions from regulatory requirements. One example that can be cited for this approach is the Bavarian Broadband Support Programme, in which the supply of rural areas is to be improved by means of tenders along with state subsidies.

b. Reliable framework conditions for price differentiation and network neutrality

Bottlenecks in the use of digital infrastructure are decreasing with the accelerating expansion of the fibre optic network. Because the fibre optic network will not be completely expanded to full coverage at least over the short to medium term, however, providers of digital infrastructure and the providers of services in the Internet will have to cope with bottlenecks. In lieu of regulation, it can be expected that business enterprises will fully leverage their possibilities for price and product differentiation. Statutory framework conditions, including the introduction and concrete design of regulation to ensure network neutrality, will have a decisive impact on the latitude for action on the part of network providers and thus have a significant influence on incentives for investors.

The design of network neutrality is essentially influenced by the following factors¹³⁴: on the one hand, German network providers have been complaining for some time now that numerous service providers – especially US companies like Apple, Facebook, and Google (Youtube) – reap significant profits without paying for the usage of data infrastruc-

Figure 5-3: sales trend for the telecommunications market in billions of Euros



Source: own diagram; data from the Federal Network Agency (2013); Federal Network Agency (2009).

133 The idea of achieving competition in the market with the help of tenders goes back to Demsetz, H. (1968): Why Regulate Utilities, *Journal of Law and Economics*, 11, pp. 55–66.

134 For a detailed discussion of the topic, Cf for instance publications by the Dialogue for Network Neutrality at the Federal Ministry for Economic Affairs.

ture. Thus it is not German or European enterprises that primarily profit from an expansion of network infrastructure, but rather foreign enterprises that pay relatively little tax in Germany and Europe. The elimination of network neutrality could allow network providers to take full advantage of their price and product-differentiation possibilities, thereby enhancing incentives for additional investment. That is why various network providers are calling for the lifting of network neutrality so that they can charge transmission fees to service providers.

On the other hand, a restriction on network neutrality constitutes a significant encroachment on Internet governance: It could put the brakes on development and dissemination of digital services that make sense from a macro-economic perspective, but for which there is not sufficient incentive to pay remuneration, while the expansion of products which are in demand and are hence paid for would increase. The variety of digital products, services and opinions would no longer be safeguarded, either.

Empirical evidence on the impact of network neutrality on investment is rather scanty thus far. Looking at the scholarly economics literature, various countervailing effects are frequently cited, although the majority of theoretical studies indicate that strict network neutrality requirements reduce incentives to invest both by network operators as well as by providers of services and applications.¹³⁵ No detailed quantitative examination or estimation of these effects is available to date, however.

In the line of fire between these different interests, the Council of Ministers of the European Union submitted a revised proposal for a regulation to bring about a unified European telecommunications market at the beginning of the year.¹³⁶ The proposal provides for the lifting of network neutrality for a limited time in order to allow network providers to conclude agreements with service providers for services that require a certain level of quality. At the same time, the draft calls for traffic management by network providers to be designed in a non-discriminatory and transparent manner so as to avoid having a negative impact on availability and quality of Internet access services.

Given this, The Expert Commission welcomes an in-depth analysis and debate of the topic network neutrality and its

impact on investment incentives for network and service providers. To increase incentives for investment at the level of network providers, partial restrictions on network neutrality like those proposed by the European Council of Ministers should be reviewed. These should go hand in hand with framework conditions, however, which clearly delimit the latitudes of network providers with regard to price and quality differentiation. These should contain both measures laying down minimum standards for best-effort Internet as well as stipulate clear requirements to apply to traffic management. A framework for the amount of differentiation to be allowed must also be put in place (the principle of non-discrimination means that all service providers can select between the same tariff options/agreements; the restriction on differentiation could be set at a limited number of contractual agreements).

c. Increase in usage of digital infrastructure through support for development of services and through applied research

When one compares the expansion of broadband connections and their actual use at present, it can be seen that only approximately 24 per cent of households/enterprises actually make use of their fibre optic connections.¹³⁷ It is to be expected that the expansion of infrastructure at the third level described at the outset will lead to completely new services and business models being developed in the digital world and at the interface to the physical world, i.e. in industry. It cannot be predicted with any level of confidence on what scale and how quickly this will happen.

It is clear, however, that the development of new services and applications on the one hand and the expansion of high-speed networks on the other mutually influence each other. Government measures supporting the development of new applications and the creation of pilot projects such as within the framework of smart grids or the decision to push forward Industry 4.0 will result in more rapid implementation of services and applications along these lines, thereby boosting the willingness of companies responsible for the infrastructure to invest. The same goes for applications-related research in this area. The positive effects on investment in new networks should be taken into account as an additional instrument with which to foster the expansion of infrastructure.

135 Cf e.g. Economides und Hermalin (2012) sowie Bourreau et al. (2014).

136 Cf Proposal for a Regulation of the European Parliament and of the Council laying down measures concerning the European single market for electronic communications and to achieve a Connected Continent, -Examination of the Presidency compromise text on net neutrality from 20 January 2015. Online: <http://data.consilium.europa.eu/doc/document/ST-5439-2015-INIT/en/pdf>.

137 Cf Dialog Consult/VATM (2014).

d. Creation of a unique European approach by means of the institutional framework

Germany is among the leading nations of the world in the field of industry, but not in the digital economy. If digital economy and “traditional economy” including industry merge together, new competitive edges in global competition will come about.

The use of infrastructure must be designed and shaped by business enterprises. The guidelines for the use of digital infrastructure come from laws, regulations and institutional framework conditions that are influenced and marked by values in the spheres of policy-making and society. European consumers have a different prioritisation of needs and assign different weights to objectives in the case of conflicts (e.g. data protection versus openness of information) than American or Asian consumers, for example. The framework conditions should therefore be thought through and cultural patterns in Germany and Europe should be coherent. The institutional and legal design of guidelines for the use of the digital infrastructure based on European values thus constitutes a model that sets Europe off from the rest of the world. One strategy for this is for example the greater concentration on European consumers and data protection in comparison to the US.

Above and beyond this line of argumentation, there are also specific economic consequences associated with this. If a European model is successful in establishing itself as a unique proposition, the economic benefits to be reaped from such will be all the greater in Germany and Europe because domestic enterprises will be confronted with an institutional framework that corresponds to their cultural values. They will thus be competing “more on a level playing field” with international competitors that have already garnered considerable experience in their own cultural spheres.

5.B. Energy

Current situation and aims

The transformation of Germany’s energy system, the “Energiewende”, is presenting German policymakers with major challenges. The decision to systematically shift a large portion of the energy supply to renewable energies at the same time as exiting nuclear power and deepening the internal energy market implies a high level of investment in almost all areas of the energy system: grid infrastructure, renewable power generation, conventional power generation, energy efficiency and storage technologies, to name but a few. All these fields of investment are closely interlinked and marked by the complex interplay between markets and regulated areas¹³⁸. Part of the investments concern public budgets¹³⁹, but the lion’s share of investments will have to be made by the private sector. Investment incentives for the most part can only be influenced indirectly, in the design of the legal and political framework conditions and incentive structures or also through targeted support programmes.

The starting point for an evaluation of these framework conditions is the energy policy targets for which a consensus was established in a society-wide process.¹⁴⁰ Here, the traditional energy industry targets should be homed in on – *security of supply, economic viability, environmental soundness*¹⁴¹, whereby the aim of environmental soundness has been translated into concrete terms in the course of the Energiewende (CO₂ reduction in parallel with the exit from nuclear power¹⁴²). As a result of recent developments, acceptance of all initiatives has been added as a key target as well¹⁴³. Accepting and designing the framework conditions in a socially fair way are closely connected.

Whilst for the aims of environmental soundness, a reduction of CO₂ emissions and the phase-out of nuclear energy, clear targets and timeframes are set forth in the Energy Industry Act (EnWG) and in the coalition agreement¹⁴⁴, for the aims of economic viability, security of supply, acceptance and social fairness there are no measurable stipulations. This imbalance in the ability to quantify the attain-

138 Cf Federal Ministry for Economic Affairs, Legislation overview for the energy supply system.

139 For instance, investments in the modernisation of the public stock of buildings to make them more energy efficient.

140 The aims are enshrined in the Energy Industry Act (EnWG) (Sections 1, 3) and were reaffirmed in the Coalition Agreement (p. 50).

141 Section 1 (1) EnWG.

142 Coalition Agreement between CDU, CSU and SPD (2013) pp. 37 and 43.

143 Cf also the Expert Commission on the “Energy of the Future” monitoring process (2014).

144 Coalition Agreement between CDU, CSU and SPD (2013) p. 50.

ment of targets harbours the risk of the last three targets identified being neglected.

The aim of economic viability equates to an inexpensive and reliable energy supply whilst at the same time complying with environmental targets. This is aimed at ensuring first that the final consumer has as low a financial burden as possible, and second at securing Germany's competitiveness as a location of production. Electricity prices basically amount to the part of the overall costs of the electricity supply that are apportioned to the consumer, government charges and taxes and possible price mark-ups if companies in the electricity sector can exercise market power. The direct logical conclusion resulting from this is that the framework conditions must be suited (i) to steering investments in such a way that the total costs of the system are optimised and (ii) to preventing the exercise of market power. Here it must always be borne in mind that the costs for the provision of energy must always be compared with the alternative of investing in avoiding consumption, for instance through energy efficiency measures. It is crucial for the reduction in consumption to be worthwhile at the individual level if this is the aim for the economy as a whole.

To achieve an inexpensive energy supply, it is therefore indispensable to install as inexpensive an energy supply system as possible. Alongside the construction and maintenance of technical infrastructures to generate, distribute and provide power, this requires a huge increase in the energy efficiency of households, businesses and industry. Highly efficient combined heat and power generation can make a significant contribution to attaining the defined targets at the interface between efficiency and generation of power and heat. Irrespective of the actual incentives to invest in the according technologies, different institutions have presented future scenarios describing an energy supply system of the future of this kind.¹⁴⁵

Estimates of the levels of investment required in Germany for the implementation of the Energiewende targets by

2020 alone lead to required investments of a total of EUR 31-38 billion per year¹⁴⁶. EUR 17 to 19 billion of this is required annually for the expansion of renewable energies in the power and heat sector, around EUR 6 billion for the expansion of the power grid (transmission and distribution grids), EUR 6 to 13 billion for additional investments to modernise buildings to make them more energy efficient and another EUR 1 billion for measures to integrate renewables into the system. EUR 27-42 billion have been estimated for the expansion of power grids up until 2030.¹⁴⁷ The huge adjustments mean that if the wrong decisions are taken there could be substantial effects on the evolution of prices. A clear focus on the aim of economic viability is thus essential for the Energiewende to be seen *ex post* as a success and for the investment climate in Germany to be promoted in a positive light.

In some areas of the energy supply system, there has been criticism for some time now of a lack of investment incentives. This concerns in particular the construction of conventional power plants, but there is a need for action in other fields of investment such as energy efficiency, co-generation of heat and power, storage technologies or so-called "smart" technologies (especially in the area of distribution systems). Investment barriers include a lack of price signals which reflect the actual scarcity of electricity at different times and places in an undistorted way, uncertainties about future framework conditions for investments and risks related to acceptance. Currently we are observing an increasing trend towards regulated market segments where cost discipline is not always a priority.

The political class has recognised this. To meet the requirements posed by a growing proportion of renewably generated power whilst at the same time exiting nuclear power, in the years to come the market design and the regulatory framework for the power sector are to be substantively reformed.¹⁴⁸ The reforms affect numerous fields of investment and it is to be expected that their interdependencies will also be addressed. Central pillars are the reform of the financial support and market integration of renewables¹⁴⁹,

145 Fraunhofer Institute for Solar Energy Systems (2013) and European Commission (2011).

146 Cf Blazejczak et al. (2013). Von Hirschhausen and Christian et al. (2014) compare different studies on the level of investment required in Europe. Between 2021 and 2030 the European Climate Foundation (ECF) estimates this at EUR 1153 billion, with EUR 68 billion required for grid expansion. Fraunhofer (2013) calculates total costs of 173 billion p. a. to maintain and operate a selected "Energy system for Germany 2050".

147 Dena (2012): Required expansion and innovation in the power distribution systems in Germany by 2030. In 2011, the European Commission anticipated the costs of EUR 1282.8 billion for European expansion up until 2050, see also Hirschhausen et al. (2014) on this, table 1.

148 Federal Ministry for Economic Affairs (2014d).

149 Here progress was made with the amendment of the German Renewable Energy Sources Act in 2014. However, there was too heavy a focus on technology-specific support. Furthermore there is a lack of incentives to set up a portfolio of renewable energies to mitigate large fluctuations in electricity prices. Cf also the comments in Löschel (2013) on this or the Sachverständigenrat zur Begutachtung der Gesamtwirtschaftlichen Entwicklung (2014).

energy efficiency, the promotion of combined heat and power, grid expansion and a comprehensive adjustment of the mechanisms for trading electricity. The aim of these endeavours must be market design that “fits like a glove” and which caters to the circumstances of an energy system significantly shaped by fluctuating renewable power generation and which harmonises with the framework conditions of other European states. A certain amount of extra time is being created through a capacity reserve in system-critical areas in order to set in motion and implement far-reaching reforms¹⁵⁰. An extensive discussion of the upcoming reforms would clearly go beyond the scope of this section.¹⁵¹ The same holds true for the issue of transmission system expansion or the possibilities and limits of regional price differentiation. Instead, the section below will highlight different endeavours which the Expert Commission feels are of particular importance, especially in terms of investment incentives.

Recommendations for action

With the Federal Ministry for Economic Affairs’ 10-point energy agenda, the Federal Government is currently at the same time making headway on a host of important reforms to establish the framework conditions for an energy supply organised on the basis of competition.¹⁵² Many of the projects go in the right direction, but some should be pursued more systematically. The Expert Commission is putting five areas of action at the heart of its recommendations.

Setting the right investment incentives. The configuration of the energy system of the future will be determined by investment incentives resulting from the framework conditions in place (and those expected in the future) for different generation and storage technologies as well as for

grid expansion, flexibility options and energy efficiency measures.¹⁵³ The current design of the market, i.e. the combination of areas organised on the basis of market-economy principles and areas subject to regulation, leads to distortions. This has led to discussions as to whether there are sufficient incentives to expand and operate conventional power plants, for instance.¹⁵⁴ There are also debates about whether the systemic value of storage solutions is adequately reflected in the current framework conditions. In all these deliberations it is important to constantly bear in mind that capital goods in the energy sector have a very long life span so the expectations regarding regulation and cost developments in the coming decades are of relevance to investment decisions.

The reform of the German Renewable Energy Sources Act, which entered into force in August 2014 (EEG 2014), tempered the cost dynamism of the renewables expansion through quantitative steering (statutory expansion corridors). The Federal Government will have to take swift further steps for a new design of the market following the EEG reform. The separation between a competitive market for conventional power plants on the one hand and a fully regulated, risk-free market for renewable on the other must be remedied. The first stage of the public debate on a new design for the electricity market has now been initiated with the “Green Paper” presented in October 2014.

The current investment and also production incentives in the area of power generation are leading to a shift of investment into the regulated field and mean redispatch and power plant reserves are growing in significance.¹⁵⁵ What is more, the ideal extent of the grid expansion depends crucially on the incentives to invest in generation capacities. This development that is being observed is the subject of controversial discussion. Some studies identify compre-

150 One can cite the discussion in 2012/13 as an example here, when gas power plants of systemic importance were supposed to be taken off the grid in Bavaria. This led to an Ordinance on Reserve Power Plants being adopted, which was meant to guarantee continued provision of capacities. Two effects are driving the lack of investment. First, excess capacities from the period of the regulated electricity market are being rolled back. Second, there is currently a lack of price signals reflecting the actual scarcity of electricity regionally and in an undistorted way. This is inhibiting the cost-efficient development of renewable and conventional capacities. Cf also Löschel et al. (2013) on this.

151 Cf “The energy transition: key projects of the 18th legislative term (10-point energy agenda of the Federal Ministry for Economic Affairs and Energy)”, <http://www.bmwi.de/BMWi/Redaktion/PDF/0-9/10-punkte-energie-agenda.property=pdf,bereich=bmwi2012,sprache=de,rwb=true.pdf>, or for the English source: <http://www.bmwi.de/English/Redaktion/Pdf/10-punkte-energie-agenda-fortschreibung.property=pdf,bereich=bmwi2012,sprache=en,rwb=true.pdf> and the Green Paper “An Electricity Market for Germany’s Energy Transition”, Federal Ministry for Economic Affairs (2014d).

152 Cf BMWi (2014d).

153 On the discussion of investment incentives on the electricity market see Grimm and Zöttl (2010, 2013), Grimm et al. (2015) or also Jenabi et al. (2013).

154 Cf the discussion on the need for capacity markets in Germany, for instance Monopoly Commission (2013), Academic Advisory Council of the Federal Ministry for Economic Affairs (2013), Haucaj (2013), Cramton and Ockenfels (2012).

155 Cf for instance Monopoly Commission (2013), p. 182/3 or Madrigal and Stoft (2012).

hensive grid expansion as the most cost-effective option for adapting to new circumstances. Other studies voice reservations about the scale of grid expansion and believe focussing on grid expansion will be a driver of costs in the medium-term¹⁵⁶ which will have a negative impact on the competitiveness of German businesses and the acceptance of the energy transition.¹⁵⁷ Regardless of this discussion, modernisation of the grid infrastructure is necessary throughout Germany in many places.

The Expert Commission recommends harnessing the current reform endeavours to direct relative investment incentives in the different areas more towards the systemic benefits of the different technologies. The aims of economic viability and security of supply must be kept clearly in mind when weighing out political alternatives – alongside environmental soundness.¹⁵⁸ In the current discussion different approaches to boosting investments in conventional and renewable generation capacities are being highlighted, please refer to the Monopoly Commission (2013), Connect Energy Economics (2014) or the Academic Advisory Board of the Federal Ministry for Economic Affairs (2013a), (2014).

Given for the most part extremely long-term investments in the energy market, the continuity of the regulatory framework in particular seems crucial. The current energy policy debate should therefore keep the aim of economic viability clearly in mind when redesigning the framework conditions and attach the greatest of importance to creating a reliable regulatory environment. The challenge here is not to hamper the possible dynamic efficiency of new technologies through the longevity of existing parts of the system. With the help of policymakers, the Energiewende has set in motion a large number of innovations which will potentially contribute to the cost-efficient conversion of the energy system to carbon-free supply. Examples of this are the development of storage solutions or the numerous

field trials on smart management in the distribution system. These potential local efficiency gains have to be coordinated sensibly with the requirements of the system as a whole.

The reform of support for renewable energies needs to be implemented and continued systematically. Alongside the question of how the planned expansion can be achieved as inexpensively as possible, there is a particular need for action to be taken when it comes to market integration. The feed-in guarantee often forces grid operators into inefficiently extensive network expansion at local level, as there are no incentives for needs-based capacity expansion.¹⁵⁹ Current reform projects are pointing in the right direction, but will have to foreseeably lead to reliable new framework conditions. The market integration of the renewable energy sources has to be pushed ahead energetically. Then regionally differentiated producer prices would also be able to have an impact on deciding which location to select for renewables.¹⁶¹

Finally, it is undisputed that there is a massive need for expansion and modernisation at the level of the distribution systems – the backbone of the local Energiewende. The Federal Government's stated aim of "investment-friendly design" of the framework conditions for the distribution systems is therefore something to be welcomed.

Energy efficiency and flexibilisation of demand. The second important pillar of the energy transition (alongside the framework conditions for the energy supply) is energy efficiency.¹⁶² The term energy efficiency is a heading which groups together activities which structure production and consumption processes in as low-energy a way as possible.¹⁶³ This ranges from measures in private buildings all the way to restructuring production processes or an entire corporate culture.

156 Cf inter alia Academic Advisory Council of the Federal Ministry for Economic Affairs (2014), Monopoly Commission (2013), Haucap and Pagel (2014) or Löschel (2013).

157 Cf also the Kronberger Kreis Scientific Council (2014), where this is detailed further.

158 The Expert Commission on the monitoring process "Energy of the Future" (2014) recommends the energy industry targets be broken down into clear indicators.

159 Cf for instance Boomsma et al. (2012), who compared investment decisions under different subsidy and support regimes. Market integration should ideally create incentives to carry out expansion at locations which serve the system the best.

161 Cf the argumentation in Löschel et al. (2013).

162 Cf. BMWI (2014c).

163 In addition to saving energy to reduce energy costs in industry, trade and crafts or for individual consumers, it is also increasingly a matter of new business models, new innovations for energy-saving measures and innovative new products. Cf. Federal Ministry for Economic Affairs (2014c), p. 2.

With the National Action Plan on Energy Efficiency (NAPE), the Federal Government has presented a list of proposed measures designed to help attain the ambitious energy efficiency targets it has set itself.¹⁶⁴ The measures adhere to the principle “Supply information – Provide support – Demand action” and encompass information services, financial incentives for energy efficiency investments through support programmes, labelling the energy efficiency of production, grants for cross-cutting technologies, energy contracting, and an obligation to undergo energy audits and comply with standards for large companies.¹⁶⁵ According to the Federal Statistical Office, in 2012 companies invested EUR 931 million in energy efficiency improvements and energy savings. That is an increase of almost 44 per cent compared to 2011.¹⁶⁶

Thus although these measures have had a clear impact, one can by no means say that all the potential for efficiency is already being leveraged.¹⁶⁷ This has to do first of all with the fact that not all decisions are taken by weighing out the costs and benefits or by analysing lifecycle costs. In addition to this a lack of transparency on energy flows and uses, market uncertainty (risk being the key term here) and uncertainty over the political framework conditions, a lack of capital and investment capital being employed elsewhere, restrictive company requirements for amortisation periods and a lack of political incentive-setting are hampering investment in energy efficiency measures both for private households (here in particular investments in the efficiency of buildings) but also in industry and in the crafts, trade and services sector. Another and significant reason is the lengths the individual actors must go to to identify savings potential and to tap into it. In particular, private households and smaller businesses are faced with the high individual costs for information and transactional costs which would be incurred outside of their “core business”. It makes sense therefore to (i) pool the acquisition of information for similar projects even more effectively and to make it available to the relevant target groups and (ii) dovetail to an even greater degree than before the information processes on efficiency potential and support or financing for measures and (iii) create greater (positive) awareness of energy efficiency potential and its cost-effi-

ciency (e.g. shift from CAPEX to OPEX perspective). Against this backdrop, the Federal Ministry for Economic Affairs and KfW are reviewing in the context of in the working group established by the Federal Ministry for Economic Affairs on “Innovative Financing concepts” as part of NAPE whether in addition to the existing instruments further financial instruments to leverage energy efficiency potential are needed. Here possible options of an energy efficiency fund and the approaches currently available on the market are being examined and assessed.¹⁶⁸

Possible solutions:

- **Setting up a fund (for instance inter alia through insurance companies)**, to issue/award fixed-income long-term bonds to private investors. The fund finances investments in energy efficiency measures, companies assign the energy cost savings to the investor/fund company (similar to contracting).
- It is also worth considering a **government risk/default guarantee or exemption from liability** (similar to Hermes export credit guarantees):
 - Guarantees lead to investor confidence and in turn to cheaper financing.
 - Guarantees also allow projects to be carried out that otherwise would not be carried out due to a poor risk/creditworthiness assessment.
 - Standardisation is necessary for small-scale projects in particular (contracts, risk assessment, etc.)

A fund solution could promote technologically neutral stimulation of fundamentally more energy efficient processes and technologies. Focussing on profitable projects bolsters the competitiveness and innovative power of German companies by concentrating on the efficiency of measures by weighing out the costs/benefits and by looking at (product) lifecycle costs. As in many areas, the realisation of efficiency gains hinges not only on the investment but also on the behaviour of the investor, while the issue of incentives must be borne in mind when it comes to matters related to risk-sharing or the assumption of guarantees (for instance moral risk).

164 Cf Federal Ministry for Economic Affairs (2014c).

165 Cf <http://www.bmwi.de/DE/Themen/Energie/energieeffizienz.html>.

166 Cf Federal Statistics Office (2014).

167 Cf for instance the meta analysis of different studies at the Renewable Energies Agency (2014).

168 Debt financing often fails due to the credit line (there are no special conditions for investments in efficiency / energy cost savings are not seen as guaranteed in contrast to feed-in tariffs for renewables) due to risk assessment, creditworthiness or the fact that the project is too small (expense of a risk assessment too high).

Major investment potential lies in increasing the energy efficiency of buildings. Good advice and project development, for instance access to information, are important in particular to ensure that measures are indeed carried out which generate a savings effect. The Federal Government is currently working on the development of modernisation roadmaps tailored to individual buildings. These show a profile of measures which highlight not just the most sensible mix of measures tailored to the building in question, but also take into account the individual benefit and the cost-effectiveness of the measures at the same time. This ensures that the modernisation projects carried out do actually trigger a savings effect and the investor can compare this to the amount invested. The KfW's public support programmes for energy-efficient modernisation and construction (also in the field of non-residential) help to close a potential gap in financing between the savings that can be generated and the costs. This offer is not confined to housing used by the owners themselves, but also applies to rental space.

An improvement of the framework conditions for contracting would also help to promote private investments in energy efficiency measures. In particular, this would enable more private investments to be steered into sustainable energy-efficient modernisation of public property. Savings contracting would allow this to happen without there being any budgetary implications for the public budget. Thanks to the energy costs saved, budgetary resources would be freed up for other public spending and investments. Spillover effects onto the owners of private buildings could also be expected from the increased use of energy contracting.

Public contractors should gear their awards procedure more towards the aims of the Energiewende. In the area of public buildings in particular, significant efficiency potential can be leveraged by more frequent inclusion of energy efficiency criteria and lifecycle costs in the description of the services being procured and when setting criteria according to which contracts are awarded. As part of the revision of the law governing the award of public contracts the opportunities to include such criteria already available today are being boosted further.

Creating a stable environment – minimising regulatory risk. The recommendations of the Expert Commission are driven by the desire to adjust the incentives in the different fields of investment so as to ensure a more cost-efficient design of the overall system resulting from the interplay between the activities of the market participants and regulators. This is not just of interest in terms of efficiency, but the best way to achieve stable framework conditions in the medium to long term. One can expect that the half-life of the regulatory framework conditions will be all the longer (i) the better the framework conditions implement the energy industry targets and (ii) the better the rules harmonise with the regulations of the neighbouring countries.

Regulatory risk is currently seen as one of the greatest obstacles to investing in the energy sector.¹⁶⁹ To a certain extent, regulatory uncertainty is inherent in the system and should not be viewed as a problem. If the predictability of political decisions drastically decreases, however, this does lead to problems.¹⁷⁰ If one recalls that the expected flows of payments which ultimately determine the profitability of an investment are directly contingent on political decisions or their revision, this becomes apparent. The most striking example is the Renewable Energy Sources Act (EEG): the ensured feed-in tariffs generated the highest level of certainty possible on the expected returns on an investment and as such led to extensive additional capacity being installed. Had the investors expected on the other hand that this promise would be broken – i.e. contrary to announcements that the support was to be cut back during the 20 year period it was planned to run for – one would have had to expect far fewer activities in this regard. The dependability of the framework conditions is therefore key to individual measures being able to have an impact. The fact that mistakes in decisions regarding the optimum level of support cannot be rectified for this reason show how important it is to establish coherent and effective rules right from the outset.

In the course of the current reform of the energy market, binding decisions will have to be taken in various different investment fields. This concerns first and foremost the issue of the design of the electricity market and the regulations governing auto-generation of power, the exemptions for energy-intensive industry in relation to the EEG sur-

169 Cf for instance Connect Energy Economics (2014) in the lead study on the electricity market commissioned by the Federal Ministry for Economic Affairs.

170 Cf for instance Wilson (2012).

charge and any other possible charges or the principles for calculating grid charges.

As the exposure arising from regulation perceived by stakeholders is hard to grasp in tangible terms and has to be traced over time, it might be worth considering developing an indicator to assess the success of measures to reduce regulatory risk.¹⁷¹

Boosting communication. The Coalition Agreement cites the acceptance of the Energiewende by citizens as one of the key challenges.¹⁷² This seems a fair assessment, given the scale and ambitious timeframe for the planned transformation of the energy supply. Whether this is successful depends not least on the willingness in broad sections of the population to actively contribute or to accept changes in their lives. Acceptance is important in any case as the market potential of innovations arising in connection with the Energiewende depends on the perceived success of the path Germany has opted for. If the perception takes hold that broad sections of the population are not behind the developments, then it is unlikely that other states will emulate them, with negative consequences for the export potential of these technologies. The verdict of businesses is also crucial to the international appeal of the Energiewende.

Acceptance can be influenced directly or indirectly through various different channels. One central channel has already been addressed – if the impression takes hold that the Energiewende goes hand in hand with too significant an increase in energy prices without this simultaneously being offset by energy savings, then rejection by broad sections of society is to be expected. For companies and households alike, ultimately it is the costs that actually have to be paid for the energy supply that are decisive here. These take the form of “energy unit costs” from the perspective of companies and show the “costs of the use of energy per unit of value creation”.¹⁷³ Also in terms of the design of the electricity market, acceptance is of key importance.

Another channel is important to name here. An evaluation of energy policy proposals based on objective criteria and decision-making recognisably guided by this are highly important. Policymaking is already moving in this direction with the “Energy of the Future” monitoring process, but there is still more to be done. Options for decision should be evaluated plausibly and independently. The extensive consultation processes should continue and be expanded. Ideally, processes should enable decisions and the grounds on which they are based to be communicated transparently. This is of great importance in particular when acceptance problems are to be expected (for instance like with the planned electricity line expansion).

Enabling evaluation. In addition to this, as extensive a body of data as possible should be generated and made available to the scientific community.¹⁷⁴ This is of key importance for various reasons. First, it allows better quantification of the *degree of attainment of the target of economic viability* in the list of energy policy targets. Models already exist today which are able to compare the optimum (that is the lowest-cost) system configuration with the configuration to be expected under market conditions.¹⁷⁵ How precisely reality can be mapped crucially hinges on the availability of data to calibrate models.¹⁷⁶ If this is possible, then electricity price developments can be compared under alternative framework conditions for instance. This would enable better assessment and communication of the benefits (and the costs) of policy decisions. The plans for a revision of the Energy Statistics Act are a step in the right direction. In the course of this process, the required needs should be clarified with scientists from different disciplines.

To enable the scientific community to support the political process as extensively as possible, it must in particular be ensured that the data is available in such a form that the relevant scientists can make use of it. In terms of the energy market this is of particular significance because the evaluation of different aspects of policy proposals is performed by different disciplines. While for some technology-related

171 For instance building on Baker et al. (2013), who develop an index for the uncertainty of the policy environment.

172 Coalition Agreement between CDU, CSU and SPD (2013), p. 40.

173 Expert Commission on the “Energy of the Future” monitoring process 2014: Statement on the first progress report par. 354 pp. (p. 187 pp.); European Commission 2014: Energy Economic Developments in Europe.

174 This point was made in detail in an expert opinion of the Academic Advisory Council of the Federal Ministry of Economic Affairs and Technology on the evaluation of economic support measures as an element of an evidence-based economic policy (2013).

175 Cf Grimm et al. (2015). The model developed here is currently being expanded to model Germany with links to other countries and to evaluate different policy proposals.

176 There are some major shortcomings in this regard.

issues detailed electrotechnical data is necessary, economic analyses often require aggregated sets of data. Preparing the data requires a huge amount of time and effort and often cannot be done by individual scientists and scholars. The aim should be for such sets of aggregated data to be available for evaluation, in particular when they have been used to plan the decisions by the regulatory authority and already exist.

In addition to the *ex ante* evaluation of proposals, wherever possible the evaluation of new provisions should already be planned at the time of their introduction. Currently, for instance, the provision for support under the Renewable Energy Sources Act is being switched to an auction procedure.¹⁷⁷ Here the aim is to engineer the shift in such a way that it becomes possible to evaluate potential savings. Generally speaking – where possible – the goal should be to evaluate measures. The results of this evaluation should be taken into due account as part of potential revisions of measures.

Conclusions

To boost investments in the energy sector and steer them in the right direction, the Expert Commission has identified a series of priorities which are summarised briefly below:

Gearing grid and power generation investments more towards the criteria of systemic benefits. The framework conditions should ensure *efficient coordination of grid expansion and expansion of power generation capacity*. The incentives for producers for building and location selection provided accordingly should then also come into play for *renewables* in the medium term. For this to happen, their market integration must be pushed forward resolutely.

Boosting investments in energy efficiency. The development of new energy efficiency instruments should be examined in order to reduce informational and transaction

costs for individual projects by pooling comparable projects and in order to lower the individual costs of implementation through synergy effects. Furthermore, transparency regarding energy consumption should be improved and a change in mentalities should be initiated towards a lifecycle costs perspective. Improving the framework conditions for contracting will also help promote private investments in energy efficiency (for instance in the field of modernising public infrastructure/buildings to make them more energy efficient).

Reducing regulatory uncertainty. Framework conditions which come as close to the aim of economic viability as possible and harmonise well with European framework conditions promise greater acceptance and have a longer half-life. In doing so, they will lower the *regulatory risk*, one of the *key obstacles to investment* currently. We suggest recording the regulatory risk subjectively perceived by key actors, for instance with the help of a suitable *index*.

Bolstering acceptance. The aims of economic viability and security of supply – alongside environmentally soundness and local acceptance on the ground – must be kept clearly in mind. Meeting the aims and targets of the *Energiewende* whilst at the same time ensuring low energy prices and costs is crucial to securing *acceptance among citizens* and maintains the *competitiveness of Germany as a centre of industry*. The pros and cons of different measures should be *communicated* and discussed *in transparent processes* with a view to promoting acceptance. This also means taking impact on employment into account.

Making the attainment of targets measurable. To enable a clear orientation towards the target of economic viability it needs to be made more *measurable*. The prerequisite for this is the *provision of suitable data*, enabling an approximation of efficiency gains as a result of energy policy measures with the help of models. External expertise should be incorporated to evaluate different approaches and to identify the right approach.

177 VCf Federal Ministry for Economic Affairs and Energy (2014).

5.C. Young enterprises

Young enterprises make an important contribution to the German economy's ability to innovate and compete. Innovative products and processes are often developed and implemented at young businesses.¹⁷⁸ Especially start-ups in the field of high-tech and knowledge-intensive services demonstrate an above-average tendency to innovate. They may not account for a high percentage of total start-ups, but they are especially relevant for Germany's innovation potential. Creating start-up friendly conditions is therefore not only important with a view to employment policy – it is also an important precondition for a successful innovation policy.

Start-up momentum in Germany

In recent years, the number of start-ups in Germany has declined, from around 253,000 start-ups in 2000 to 163,000 in 2013. This is a drop of more than 35 per cent.¹⁷⁹ The number of start-ups in the high-tech and software sectors has also fallen over the past few years, although not as significantly, with the share of high-tech and software start-ups in the total number of start-ups increasing slightly as a result. On average high-tech and software start-ups accounted for around 7 per cent of all new companies in the period from 2011-2013.¹⁸⁰

When it comes to the motivation behind the establishment of a new company, the start-up statistics distinguish between those aiming to tap into a market opportunity and those resulting from a lack of alternative earnings opportunities. If one compares these two different motivations for founding a start-up in relation to each other, then there are 4.11 start-ups to tap into a market opportunity for every one resulting from a lack of alternative earnings opportunities in Germany. In international comparison with innovation-based countries the German ratio is very low. Coun-

tries like Sweden (8.51), the Netherlands (10.89), Switzerland (11.66) or Norway (22.60) have a far higher share of start-ups resulting from market opportunities.¹⁸¹

Germany's strengths and weaknesses as a location for start-ups

For start-up experts, Germany's strengths as a location for new businesses lie above all in the well-developed public funding structure.¹⁸² But the physical infrastructure, institutional protection of intellectual property rights and the openness of businesses and consumers to new products and services are also seen as strengths Germany offers as a location. The most significant obstacles to start-ups in Germany on the other hand are cited as being the lack of a start-up culture, regulation and tax provisions as well as dissatisfactory financing conditions.¹⁸³

One reason for the lack of a start-up culture is often the fear of failure. This is very pronounced in Germany compared to other innovation-based countries like Norway, the US or Switzerland. The fear of being labelled a failure by friends and family or by banks is cited as an obstacle to starting a business by 49 per cent of those interviewed in Germany in a survey of the population by the Global Entrepreneurship Monitor. In 16 of the 25 other innovation-based countries surveyed, this figure is much lower.¹⁸⁴ Failure is part and parcel of starting a business, however, and should not be seen as a general failure by any means. Federal Government initiatives, for instance in the field of insolvency law now focussing more on a new start, is held to have not yet changed society's attitude towards the risks of starting a business and potential failure. Further awareness-raising measures were felt to be required here, possibly also as part of an information campaign.

178 Cf Audretsch et al. (2006).

179 In addition to the good macro-economic situation, which has led to a drop in the number of necessity start-ups in recent years, this is also due to cuts in funding for start-ups effective as of 2012. Cf on this the "German Act to improve the chances of integration on the labour market" *Gesetz zur Verbesserung der Eingliederungschancen am Arbeitsmarkt*, Federal Law Gazette 2011 Part I No. 69, 2011. This meant that the number of start-ups receiving funding from the Federal Agency already fell to 51,900 in the first half of 2012, a drop of 80 per cent. Cf European Commission (2015).

180 Cf ZEW (2014).

181 Cf Brixy et al. (2013).

182 This also includes a good initial advice structure in the regions. Chambers of Commerce and Industry alone inform and advise 200,000 people starting a business every year. Cf. DIHK 2014a

183 Cf Brixy et al. (2013).

184 Cf Brixy et al. (2013).

The promotion of coaching for start-ups gives new entrepreneurs the opportunity to receive competent advice from an advisor during the difficult phase of building up a business. In the phase prior to actually founding the business in particular, this can help eliminate barriers and reservations. Such programmes are offered by the Länder (pre-start-up phase) and by the Federal Programme for Start-up Coaching in Germany (post-start-up phase).

Small and medium-sized enterprises in particular are held back by legal regulations and the costs associated with these. Especially when it comes to start-ups, bureaucratic hurdles as a result of regulatory stipulations – like the number and length of the procedural steps required to register a company, the costs of registration and minimum capital requirements – can have a negative impact on the business' ability to develop. In the World Bank's ranking on the ease of starting a business, Germany ranks 114 out of 189 countries in 2015, demonstrating relatively high regulatory hurdles for starting a business by international comparison.¹⁸⁵

The recent decisions adopted by the Federal Government to cut red tape for medium-sized businesses (Bureaucracy Reduction Act – *Bürokratieentlastungsgesetz*) are therefore a step in the right direction. The approach that in the future more entrepreneurs starting a business will be exempt from certain statistical reporting obligations in the first three years by raising the thresholds in different economic statistics acts and by introducing thresholds for reporting obligations for environmental statistics is to be particularly welcomed.

Additional measures have the potential to consolidate and secure this progress in reducing bureaucratic hurdles. The introduction of one-stop agencies would enable quicker and more straightforward procedures for starting a business in Germany and cut the red tape faced by start-ups. These could be integrated into the regional chambers of commerce and industry, for instance, and dovetailed with the existing start-up service. Another possibility for lowering the existing regulatory requirements for those starting a new business and fledgling businesses would furthermore be returning from monthly to quarterly advance VAT returns. This would reduce the high amount of admin faced by those starting a business. In addition to this, information obligations for transfers of business need to be sim-

plified. Currently transfers of business mean the employer has to meet strict requirements in terms of his obligation to inform employees. Germany overdid things when it transposed the EU Directive on this into national law. This leads to a considerable amount of legal uncertainty for all concerned.¹⁸⁶

Barriers to financing

One key start-up and growth obstacle for fledgling businesses is the lack of access to financing. For innovative start-ups in particular, securing sufficient financial resources is often especially difficult.

Frequently, very high investment sums are required in the growth phase, while returns do not materialise until much later. Start-ups are high risk due to the innovative nature of their products and services, a risk which is difficult to judge given the very brief company history. Added to this are information asymmetries in terms of the entrepreneurs' ability and readiness to take risks. This makes the prospects of success difficult to judge for external investors.

Young enterprises therefore often fall back on their own resources or the financial support of their family and friends. The high level of financing required by innovative businesses, however, requires the use of additional financial resources from external investors. The lack of security associated with innovative companies makes it more difficult to secure financing in the form of a bank loan. One possible alternative is financing through public or private equity capital. Providers of equity capital provide entrepreneurs and businesses with funds in the form of equity. In the event of success this means they have a proportional share of the growth in value and profits, while in the event of a loss, they are not repaid any set amounts.

Equity capital

In the early start-up phase, it is above all Business Angels that invest and that are mostly experienced start-up entrepreneurs themselves. Investments by Business Angels are recording high growth rates in Europe. The number of Business Angels networks grew to more than 1,400 in 2009. The significance of Business Angels investments is often

185 Cf Ranking for "Starting a Business" in 2015, Doing Business, World Bank Group, <http://www.doingbusiness.org/rankings> (last called-up on 5 February 2014).

186 Cf DIHK (2014a); DIHK (2014b).

underestimated, as they are often not made public. The OECD estimates that Business Angels investments in Great Britain and the US in the last ten years outweighed venture capital investments in early-phase financing.¹⁸⁷

According to current estimates by the Centre for European Economic Research (ZEW), Business Angels were only involved in around four per cent of all the start-ups recorded from the high-tech fields of the manufacturing industry and the service sector in Germany in the period from 2009 to 2012. This is the equivalent of around 3,700 Business Angel-financed high-tech start-ups. On average, Business Angels (silent private investors) invested EUR 294 (275) thousand in companies from the industrial high-tech sectors, EUR 107 (82) thousand in those from the technology oriented service sectors including software, EUR 113 (64) thousand in companies from the non-high-tech sectors of the manufacturing industry and EUR 40 (38) thousand in the business service sectors forming part the non-technology oriented sectors. The amounts invested cover a wide span, the highest amounting, in particular in the industrial high-tech sector, to sums of several million Euros.¹⁸⁸

In the subsequent growth phase of innovative start-ups, it is above all venture capitalists that invest. Here, investments from different investors are often pooled into funds and administrated by fund managers. In Germany the market for venture capital is relatively small. One of the reasons for this is the lack of large anchor investors. Lacking opportunities to secure follow-up financing may also prevent venture capital investments. This requires above all liquid secondary markets enabling flexible exit options and increased incentives for investors. We therefore welcome the fact that the Federal Government and the Deutsche Börse are looking for suitable solutions.

Further steps are necessary to facilitate venture capital investments in Germany and to match countries like Sweden or Finland as a result. This could be helped – if the necessary reciprocal financing is secured – by a less restrictive treatment of loss carry-forwards in the event of change of ownership or the entry of new investors (cf chapter “Framework conditions for innovations”). Future amendments to legislation to improve the framework conditions for venture capital investments should also always be designed to

encourage a long-term outlook and commitment on the part of providers of funds.

Government support measures

Gaps in financing often arise in the early stage of starting a business, as financing from Business Angels is often limited and venture capital investors increasingly do not invest until the later growth phase. To bridge this financing gap in the early phase, different support measures have been put in place.

The support programme “INVEST – Venture Capital Grant” was introduced in 2013 to bolster the commitment of Business Angels. This aims to make investments by Business Angels more attractive and to increase the investment sums acquired. 20 per cent of an equity investment is reimbursed (maximum of EUR 250,000) if Business Angels invest at least EUR 10,000 in a young, innovative business and maintain their investment for at least three years. To increase the incentive to mobilise private equity capital, the INVEST support provided for venture capital was exempted from income tax on 1 January 2015 – retroactively for all INVEST grants paid out to date.¹⁸⁹

In the support measure of the ERP Start-up Fund, the KfW Banking Group is also promoting access to equity capital for fledgling technology companies. The prerequisite is that a lead investor invests in the company. The KfW then invests an amount of up to 50 per cent of the amount invested by the lead investor in the company.

To improve early-stage financing for businesses from high-tech fields, in 2005 the High-Tech Start-up Fund (HTGF) was set up and replaced by HTGF II in 2011. HTGF II is a fund totalling EUR 288.5 million, in which the Federal Ministry for Economic Affairs and the KfW Banking Group as well as twelve industrial groups have a share. In addition to the financial resources, support was offered in acquiring follow-up financing. HTGF I received a very positive evaluation overall. It enabled the stagnating market for seed financing in Germany to revive and existing gaps in financing to be narrowed in this area. Furthermore there are no indications of a crowding out of private venture capital investments.¹⁹⁰

187 Cf OECD (2011a).

188 Cf ZEW (2014): Report entitled “Finanzierung von jungen Unternehmen in Deutschland durch Privatinvestoren.” (Financing of young enterprises in Germany by private investors”).

189 Cf Federal Ministry for Economic Affairs (2014).

190 Cf EFI (2012).

Alongside this, the ERP/EIF fund of funds and the European Angel Fund Germany, which are being topped up to EUR 1.7 billion, and a new EUR 400 million KfW fund investment programme are boosting capital available from venture capitalists in Germany.

These positive government support measures should be continued and constantly evaluated to enable adjustments. Furthermore the expansion of the private venture capital market in Germany aspired to must under no circumstances be used to completely replace government support. Even in countries with major venture capital markets, government support continues to play an important role. In the US it is estimated that up to one quarter of the total financing for technology start-ups came from government programmes in 1998.¹⁹¹

The use of government support measures also makes it necessary to ensure that not only private entrepreneurs benefit from them, but also the community as a whole. This happens, for instance, by new jobs being created or through spillover effects of new technologies onto other businesses. If government funding is in the form of equity capital, the public will moreover have a stake in the financial success of the young enterprises.

Crowdfunding

An innovative and comparatively new form of financing for young enterprises is crowdfunding. Fundraising organisations support start-ups using special Internet platforms or via social networks in raising funds from contributions from as many people as possible. These contributions can take the form of loans, stakes in the company, down payments on future products yet to be developed or donations. In addition to numerous projects from the creative sector, in Germany examples of start-up financing can be found in the area of premium technologies and knowledge-intensive services.¹⁹² Crowdfunding offers an interesting alternative or a supplementary source of financing in particular for innovative start-ups in the early start-up phase. At the same time there are risks in terms of the protection of small-scale investors. So if there is a desire to maintain the

growth potential of financing through crowdfunding in Germany and expand it in the long run, there are regulatory challenges to be faced in balancing investor protection and the protection of the platform operators and in terms of European harmonisation of the regulations governing crowdfunding activity.¹⁹³

Doing more than just funding to support young high-tech companies

Once innovative enterprises have successfully completed the start-up and market launch phase, obstacles such as the delayed market maturity of the product or increased demands on the management can constitute important barriers to growth. Additional impetus is required to support precisely promising fledgling businesses which register stagnating growth in spite of innovative products after their first market success (“*blocked beauties*”) and as such have difficulties in securing sufficient financing to realise their market potential.

It is for this reason that the Federal Ministry for Economic Affairs is currently planning to set up an ERP/EIF growth facility with a volume of EUR 500 million, which in tandem with investors will mobilise growth financing of up to EUR 40 million per company. But to address all the relevant obstacles to promising companies that can lead to growth shortcomings, coaching opportunities could be offered alongside such financing programmes, which thanks to close cooperation with expert teams from business and industry would impart the companies with industrial expertise, management experience and finally also put them in contact with investors with capital clout, including with the aim of preparing them for an IPO. A competition financed by the private sector could be used here to identify companies with a high value-creation growth potential that the private sector has been unable to fully tap into thus far. The cost of coaching could be paid for by shares in the company and as such be paid back contingent on the company’s success. If the Federal Ministry for Economic Affairs were to support the initiators of the competition as patron and help set up a contact network (but not as co-financer), this would be something to be welcomed.

191 Cf Auserwald and Branscomb (2003).

192 For instance, the nano particle producer Particular GmbH was able to finance a spin-off of Laserzentrum Hannover e.V., marketing and staffing measures amounting to almost EUR 100,000 thanks to an investment-based crowdfunding appeal (cf EFI, 2013).

193 Cf EFI (2013).

Protection of intellectual property rights

Innovative small and medium-sized enterprises (SMEs) play an important role in high-tech industries such as biotech and rapidly growing green industries as well as in the creative sector. They combine intangible goods, new technologies and design and are often a crucial driver of innovation. Even in traditional industries, innovative SMEs account for between 33 to 55 per cent of all SMEs according to the OECD.¹⁹⁴ For these young enterprises, securing their intellectual property is a key concern. Formal protection rights for intellectual property enable knowledge to be converted into property rights which give the owner the right to exclude others from the commercial use of this knowledge. The use of these property rights can facilitate the commercialisation of ideas of young enterprises and boost their competitive position. At the same time, patent rights granted can, for instance, convey signals to external investors about the ability of the entrepreneur and the value of the business idea¹⁹⁵, but also protect companies from patent infringement suits.

The OECD notes in a corporate survey of European SMEs¹⁹⁶ that they often shy away from using intellectual property protection rights. The reasons for this are the high costs¹⁹⁷ and time-consuming application procedure and a lack of trust in the ability to assert these protection rights. Furthermore there are uncertainties about their strategic use.

Although the institutional framework for protection rights for intellectual property are generally viewed to be very good, for German SMEs there may be special challenges which arise. For SMEs which operate internationally, applying for and asserting protection rights for intellectual property entails high financial costs. The introduction of the European patent with uniform effect in all EU Member States and the establishment of a European patent court should reduce the costs for registration and enforcement of international patents and are to be welcomed.

Information services for SMEs provided by chambers of commerce and industry and by the patent information centres of the German Patent and Trade Mark Office help to dismantle information barriers with a view to the use of

rights protecting intellectual property. Existing support programmes at the Federal and Länder levels (for instance the Federal Ministry of Economic Affairs' SIGNO support programme) should be better dovetailed and made more visible. In light of the OECD survey, additional efforts should be made to advise SMEs operating internationally on the strategic use of intellectual property protection rights and the enforcement of these rights in third countries.

Recommendations for action

Improving the framework conditions for start-ups. Start-up entrepreneurs need to be given more support in Germany. Doing away with bureaucratic hurdles for start-ups and lowering the regulatory requirements for start-up entrepreneurs and fledgling companies is necessary to achieve this.

Dismantling financial obstacles. Obstacles impeding financing for young enterprises need to be reduced further. To this end, tax obstacles for private investors to invest in equity capital should also be dismantled. A package of measures to stimulate IPOs among young growth companies can counter the lack of follow-up financing and promote private venture capital investments.

Connecting financing to coaching. Financing programmes should be accompanied by coaching opportunities, in which expert teams from business and industry pass on industrial expertise, management experience, market partners and finally contacts to investors with capital clout to young companies, also with the aim of preparing such companies to go public on the stock exchange.

Opening up regulatory framework conditions for new financing methods. The potential harboured by the still relatively new financing form of crowdfunding should be harnessed and expanded over the long term. Regulatory challenges in balancing protection of investors and the protection of the platform operators must be dealt with early on and progress must be made on European harmonisation of the regulations governing crowdfunding activities.

194 Cf OECD (2011b).

195 Cf for instance Conti et al. (2013) and Audretsch et al. (2012).

196 Cf OECD (2011b).

197 A patent that is registered in all EU-28 States costs an estimated EUR 36,000, EUR 23,000 of which is spent merely on translation fees (cf European Commission, 2011).

Better dovetailing information on protection rights. We welcome the introduction of the European patent with uniform effect in all EU Member States and the establishment of a European patent court. This offers the potential to lower the costs of registering and enforcing international patents and thus to facilitate their use by small and medium-sized enterprises. Additional efforts are needed to interconnect existing information services for SMEs at the Federal and Länder levels and to support advice for SMEs operating internationally on the strategic use of intellectual property protection rights and their enforcement in third countries.

6. Europe: Germany's contribution to Europe's investment agenda

Europe is fighting poor growth prospects and a growing risk of deflation, which are adversely affecting investment in Europe. Since peaking in 2007, the level of investment in the EU has fallen in real terms by approximately 15 per cent and is thus significantly lower than the historical trend. In other words, the level of investment in Europe today is EUR 430 billion less than it was just seven years ago; it also falls considerably short of the average of the past 20 years. Even when extreme trends (housing bubbles, etc.) are discounted, the EU's investment rate in 2013 was approximately two percentage points lower than the long-term average. This has an adverse effect on economic recovery, job creation, and on Europe's long-term growth and competitiveness.

Europe as a whole has everything needed to fight the crisis and at the same time make itself fit for the future: well-trained people, productive enterprises, strong private and public financial intermediaries, a strong and innovative industrial sector, well-functioning public and private services, innovative research institutes and educational institutions, strong trades, well-developed rule of law and social justice, cultural diversity, a large and integrated common market and not least of all a stable common currency. Thus equipped, Europe can enable prosperity and employment for all.

However, the resources and capacities for this type of strategy are unevenly distributed: There are still social, economic and ecological disparities between the nations of Europe. Even though economic and living conditions in the different countries can never be completely brought into line with one another, a well-functioning monetary union requires a convergence process in the Member States. Many countries in crisis must implement urgently needed reforms in order to make their economies more flexible, productive and socially equitable. However, many countries in crisis also need support in order to become competitive, develop a solid foundation for the future and return to a stable growth path. To achieve this, European partners must utilise synergies to the greatest possible extent, increase institutional cooperation and make better use of common resources. These activities should centre on a joint investment and modernisation campaign. Reforms that focus solely on austerity measures cannot succeed.

The Expert Commission therefore advocates that the European Member States and the European Commission launch

a long-term investment programme for Europe. The investment plan developed under the President of the European Commission, Jean-Claude Juncker, is a first and important step in the right direction for an investment campaign of this kind. For this reason the Expert Commission stresses the need to support the "Juncker plan" on the financial, institutional and political level.

The Juncker plan could potentially be developed into a long-term investment programme for Europe if it is effectively designed, the European Fund for Strategic Investments (EFSI) is successfully launched and outstanding issues are resolved. This type of programme could generate impetus for faster growth over a long period, increase competitiveness and create more jobs. It would also make a contribution to modernising the economies in less-developed EU Member States and increasing their productivity. This would strengthen European demand and support the economic and institutional convergence process that is necessary for European integration and the common currency.

Public investment constitutes an important pillar for a stable growth path. Public investment leads, due to its productivity and capacity-increasing effects and its income-generating effect, to a crowding in - on both the supply and the demand side - of additional private investment that continues to be crucial for additional growth and jobs. Last but not least, this type of investment plan corrects the heavy burden on monetary policy that has arisen to date in connection with efforts to deal with the crisis. The two other pillars for fighting the European crisis and the risk of deflation and for generating continued impetus are - alongside the currently very expansive monetary policy - a fiscal policy that is geared to investment and a sustainable structural policy.

Expand the Juncker plan

Even before his election, the President of the European Commission, Jean-Claude Juncker, identified the problem of weak investment as the central political challenge in his Political Guidelines for the European Commission 2014-2019. The Expert Commission agrees with this analysis. There is a considerable need for investment, not only in Germany but also throughout Europe. His proposal revolves around the observation that Europe has significant levels of savings and high levels of financial liquidity -

albeit very unevenly distributed between countries and income groups - which are increasing year after year. At the same time, EU Member States and, to some extent, private households and companies are reducing their debt. Consequently the demand for credit is not growing in line with the growing availability of capital in the market. On the other hand, there are many useful investment projects that are undisputedly important and indeed absolutely necessary for the future viability of our continent. Under these conditions, the European Commission proposed in its Communication "An Investment Plan for Europe" from 26 November 2014 an initiative at EU level to mobilise private capital.

The Expert Commission welcomes the Juncker plan for mobilising private capital for investments aimed at ensuring future development. It recommends examining the establishment of the Juncker plan for Europe on a permanent basis should it prove to be successful.

1. This investment plan is based on three mutually reinforcing strands: Mobilisation of at least EUR 315 billion in additional investment over the next three years in order to maximise the impact of public resources and unlock private investment;
2. An organisational framework that ensures that this extra investment will meet the needs of the real economy;
3. Measures to provide greater regulatory predictability and to remove barriers to investment with the aim of making Europe more attractive and thereby multiplying the impact of the investment plan.

The European Commission will work closely together with the European Investment Bank (EIB) as a strategic partner. The third strand of the investment plan relates to the regulatory environment and the elimination of barriers to investments. In light of the key role that small and medium-sized enterprises (SMEs) play in the economy of the European Union, particularly with regard to job creation, the investment promotion foreseen in this proposal will be primarily aimed at SMEs. It would be advisable here to include the social partners and civil society in this in order to organise the broadest possible support for an investment-friendly climate.

European Fund for Strategic Investment (EFSI)

The European Fund for Strategic Investment (EFSI) is at the heart of the Juncker plan. The EFSI is presently supposed to start with a guaranteed amount of EUR 21 billion. A strategic partnership with the European Investment Bank (EIB) is envisaged. The mechanism for generating EUR 315 billion in capital from the EUR 21 billion in guarantees and EIB credit - nearly 15 times the starting amount - provides for the EUR 21 billion serving as the basis for the EFSI. The EIB plans to invest some EUR 49 billion in projects and thus mobilise further investments totalling EUR 240 billion (first-loss protection). Another EUR 12 billion are to be used in "SME windows" to mobilise a total of EUR 75 billion in financing through the EIF for SMEs and midcaps.

Risk is to be assumed with the aim of increasing the willingness on the part of the participating promotional banks (EIB and national promotional banks) and on the part of participating private investors to invest in these types of long-term projects. The projects themselves are then supposed to trigger further private investments via the above-described supply and demand effects. The risk involved in this plan is however the uncertainty whether it is sufficient in its present form to significantly increase willingness to undertake private investment in Europe.

At the same time, the level of investment required is high. According to an investment task force set up by the European Commission and the EIB, there are approximately 2,000 major planned projects in Europe with a total investment potential of some EUR 1,300 billion. According to the European Commission's plans, projects with a volume of more than EUR 500 billion could potentially be implemented in the coming three years.

The question here is whether the plan in its present form will bring a sufficient crowding in of private investment. There are doubts about this at three levels: Firstly, the targeted EUR 315 billion might not be reached. Secondly, even if this amount is reached, it might not be enough to have a strong macroeconomic impact. Thirdly, private investors might fear that the plan is only a flash in the pan. The EUR 21 billion in the EFSI will be covered by funds from the European Commission's current budget (and a one-off allocation from the EIB). The plan's investment strategy is aimed at preserving the EFSI's capital through careful pro-

ject selection and suitable risk premiums. However, in the event that unexpected losses occur - which is entirely possible given that the underlying investments are geared to a higher level of risk - this could significantly reduce the plan's maximum investment volume.

In order to increase the EFSI's capital, the European Commission is inviting Member States to provide further funding. The Stability and Growth Pact has meanwhile been construed in such a way that contributions to the Fund do not result in an increase in the deficit/debt that is relevant to the deficit criteria. At national level, it is also possible to co-finance EFSI-funded projects. In such cases, co-financing does not play a role for the Stability and Growth Pact when the respective country is only in the preventive arm of the Stability and Growth Pact, either. Therefore the eleven Member States that are currently in an excessive debt procedure (these include France, Great Britain, Spain, Portugal and Greece) cannot in fact co-finance projects.

None of the Member States have declared their willingness to invest in the EFSI to date. The Federal Government supports the Juncker plan. However, financial support should take the form of co-financing that is provided for specific projects; this co-financing would be provided through the Kreditanstalt für Wiederaufbau (KfW) in the amount of EUR 8 billion (EUR 1.75 billion for global loans which subsequently go to enterprises via European promotional banks; EUR 5.5 billion for project financing, EUR 600 million for supporting venture capital projects; EUR 150 million for the "Marguerite" infrastructure fund). In the Expert Commission's view, it would be advisable to examine the possibility of Germany assuming a direct financial interest in the EFSI.

Conclusions

Additional measures would have to be taken to ensure that the Juncker plan is effective on a long-term basis. Since the need for investment and the availability of capital in Europe are both long-term in nature, it would be useful to, following an evaluation of the Juncker plan, examine whether the EFSI should be established on a permanent basis. In order to do this, the EFSI would possibly have to

be outfitted with more resources and a mechanism would have to be created for recapitalising or expanding the Fund in future, should this become necessary. The latter will require an internal decision-making culture that ensures that the possibility of future recapitalisation or expansion does not spawn any negative incentives for pending investment decisions. The EFSI governance structure should be able to fund economically useful projects and, through its assumption of larger risks, mobilise private investment. Steps should be taken to ensure that EFSI guarantees are provided on a straightforward basis with a minimum of bureaucracy.

The investment fields proposed in the Juncker plan are of strategic importance for Europe's future. This type of investment plan for Europe will improve collaboration between the countries of Europe because the enormous challenges involved in shaping the future and in crisis management can be met only on a joint basis. In light of this, strategic investments will be promoted and financed, particularly strategic investments in broadband networks and energy grids, re-industrialisation as well as in social inclusion, education, SMEs and mid-cap companies. When it is set up for the long term and has sufficient capital, this type of investment campaign will strengthen Europe's industrial value-creation and public services and help modernise the transport infrastructure and step up the deployment of broadband networks. It will ensure not only more investment in education and training, but also sustainable, "green" housing.

The Juncker plan supports the restructuring and modernisation of Europe's economies with the aim of keeping energy consumption low and using resources efficiently, becoming independent of fuel imports over the long term, and at the same time massively reducing CO₂ emissions in Europe. The nations of Europe have already committed themselves to increasing the portion of renewable energy sources in their electricity production to 20 per cent and to even reducing their CO₂ emissions by 80 to 95 per cent below 1990 levels by the year 2050. The European Commission submitted an Energy Roadmap 2050¹⁹⁸ for this purpose. The Juncker plan should be used to support an energy roadmap of this type, but without placing excessive burdens on businesses or employee households. This however will reduce European economies' dependence on fuel imports and strengthen European companies' ability to compete in the global arena.

198 Cf. Energy Roadmap 2050, COMMUNICATION OF THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS, Brussels, 15 December 2011

Last but not least, this type of strategic orientation will help develop the locational advantages of the future. And in this way the Juncker plan can make a decisive contribution to an ambitious modernisation campaign in Europe.

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