Local public infrastructure showing signs of wear and tear

By Martin Gornig, Claus Michelsen, Kristina van Deuverden

Investment in public infrastructure is essential to ensure competitiveness and create growth potential. Although Germany certainly has a well-developed infrastructure compared to other countries, local public infrastructure has been in decline for many years now. This means that current levels of investment are not sufficient to offset this decline, and the infrastructure is becoming increasingly outdated and limited in its scope.

In order for this backlog of local public investment to at least not continue growing, a rapid change in policy is urgently needed. The creation of a special central government fund to encourage investment in financially weak areas is a step in the right direction. Given the enormity of the local public investment backlog, a massive increase in immediate financial assistance seems imperative. At the same time, a systematic approach must be developed to compensate for the chronic underfunding of certain types of municipality. One improvement might be to take proper account of the financial weakness of the municipalities in fiscal equalization among the federal states.

Public infrastructure is one of the key prerequisites for growth and prosperity in modern economies.[1] This is also true of investment in research and development (R&D).[2] An efficient transport infrastructure is of fundamental importance for an economy with a high division of labor, a high level of integration in the world economy, and a central location in Europe.[3] Furthermore, modern building infrastructure is essential for maintaining and developing efficient and productive administrative, social, and educational systems.[4]

The level of public infrastructure in Germany is relatively high in international comparison and is one of the key advantages of its location.[5] However, maintaining a public infrastructure with such broad scope and high quality also has major cost implications. Compared to other countries, however, gross investment activities in Germany have not only developed more weakly over time, but the overall level is considerably lower than in most other industrialized nations.[6]

Traditionally, municipalities are responsible for public investment activities. At the beginning of the 1990s, roughly two thirds of public investment in buildings was made by municipal bodies. However, if we examine the evolution of public investment activity in Germany, we can see there has been a clear and marked decline

1 Eck, A., J. Ragnitz, S. Scharfe, C. Thater, B. Wieland (2015): Öffentliche Infrastrukturinvestitionen: Entwicklung, Bestimmungsfaktoren und Wachstumswirkungen. Ifo-Dresden Studien, 72, Dresden 2015.

2 Belitz, H., S. Junker, M. Podstawski, A. Schiersch: Wachstum durch Forschung und Entwicklung. Wochenbericht des DIW Berlin, 35.

3 3 Barabas, G., T. Kitlinski, C.M. Schmidt, T. Schmidt, L.-H. Siemers (2010): Verkehrsinfrastrukturinvestitionen – Wachstumsaspekte im Rahmen einer gestaltenden Finanzpolitik. RWI Projektberichte, Essen.

4 Reidenbach, M., T. Bracher, B. Grabow, S. Schneider, A. Seidel-Schulz (2008): Der kommunale Investitionsbedarf 2006 bis 2020, DIfU, Bericht, Berlin.

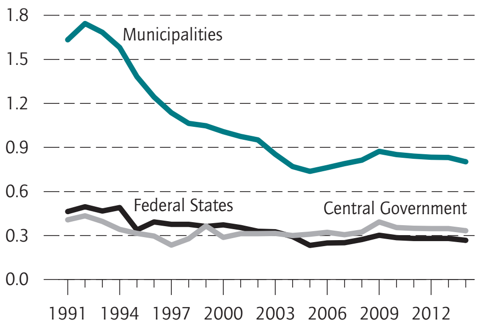
5 Bardt, H., E. Chrischilles, M. Fritsch, M. Grömling, T. Puls, K.-H. Röhl (2014): Infrastruktur zwischen Standortvorteil und Investitionsbedarf. IW Bericht, Köln.

6 Bach, S., G. Baldi, K. Bernroth, B. Bremer, B. Farka, F. Fichtner, M. Fratzscher, M. Gornig (2013): More Growth through Higher Investment . DIW Economic Bulletin 8.

Figure 1

Investment in Infrastructure by regional administrative body

In percent of GDP at current prices



Source: German Federal Statistical Office.

The municipal investment rate, in particular, has fallen considerably.

in local public investment (see Figure 1). In 1991, municipal construction investment was about 1.7 percent of GDP, but it has seldom reached even half this figure since 2005. Only the second economic stimulus package (*Konjunkturpaket II*) led to slightly higher values in the short term. Investment by the central and federal state governments, on the other hand, has followed a slight upward trend since 2005. However, these investment figures remain below GDP ratios of the early 1990s.

The following analysis focuses, in particular, on the development of local public investment activities. We have concentrated on differences in gross investment between federal states and on the development of net investment.

Investment activity of municipalities differs considerably from region to region

Investment spending has declined markedly on the municipal level in recent years, also when calculated per capita. There might be many explanations for this decline. With hindsight, it can be said that the level of investment in the federal states of the former GDR was inflated: in order to reduce the investment backlog caused by partition, former East German federal states received transfers from the Solidarity Pact. These payments have been reduced on a diminishing scale since 2005 and led to a gradual decline in investment activities. For Germany as a whole, the decline in investment activity is also the result of more and more organizational units being outsourced from the public sector to the private sector (see box).

However, it stands to reason that the financial situation of the public sector should also be taken into account as an explanatory variable for investment activity. The cash position of the central government, federal states, and municipalities was tight until well into the second half of the 2000s. The tax reform implemented after the turn of the millennium was accompanied by a considerable loss of revenue and the economy became sluggish. The former resulted in a direct hit on the development of income taxes. The latter also impacted on the volume of cyclically sensitive business tax. Accordingly, tax revenues developed only modestly. This also applies on the federal state level where the budgetary situation continued to be strained. The latter is likely to have suppressed payments made to the municipalities of federal states as part of their municipal financial compensations. This is another reason for the modest development of municipal revenues. On the expenditure side, the municipalities were burdened by national legislation forcing them to take on an increasing number of tasks; these tasks were mostly motivated by social policy and continued to increase as a result of weak economic development. Overall, the financial scope of the municipalities contracted more and more during this period.

Municipalities generally have only limited options for alleviating tight budget situations. Particularly municipalities in financially weak federal states struggle with a small tax base which can barely offset the rate of assessment for their business tax or lower municipal taxes. The capacity for indebtedness is limited on the municipal level. On the expenditure side, current expenses are quite rigid, at least in the short term.[7] The only consolidation measures available are through investment expenditure; these are more or less at the discretion of the municipalities and can be relatively quickly adjusted to the economic cash situation. Some of the decline in investment spending per capita is therefore likely due to financial difficulties in past years.

Only once economic development had recovered some momentum and tax revenues began flowing more steadily again after the financial crisis and its aftermath did the municipal budget situation improve gradually. In recent years, investment spending per capita has already risen a little in some municipalities. Since 2012 the municipalities altogether have, in fact, achieved a surplus. Certainly the underlying situation is extremely heterogenous. Municipalities in financially weak federal states, in particular, are still struggling with budgetary issues.

7 Social spending is regulated by various laws, personnel expenses—at least in the short term—cannot really be influenced, and operating expenditure is not particularly flexible either.

These differences are also reflected in the regional development of public investment spending. Municipalities in federal states such as Bavaria or Baden-Württemberg invest substantially more per inhabitant than those municipalities in financially weak federal states such as Saarland (see Figure 2). It is also evident that per-capita investment spending is gradually decreasing in the former East German federal states as the additional funds made available through the Solidarity Pact slowly dry up. In 2013, municipal investment per inhabitant was, in fact, lowest in one of the former East German federal states, Mecklenburg-Western Pomerania. This is also because municipal tax revenues in eastern Germany have only reached half of levels achieved in former West German federal states.

Taking investment by federal states and municipalities as a whole gives a similar picture (see Figure 3). Again, the level of per-capita investment in Bavaria and Baden-Württemberg is well above spending levels in other federal states.[8]

The city states can also be considered if federal state and municipalities are examined together.[9] As found in the area states (*Flächenländer*), it was discovered that the "rich" federal state of Hamburg has invested considerably more per inhabitant than the "poorer" Bremen or Berlin.[10] Per-capita investment spending has declined in all three city states. It was scaled back substantially in Berlin at the turn of the millennium and, in Bremen, after 2005, when additional financial transfers from central government were discontinued.[11] Per-capita investment spending was cut drastically, particularly in federal states where fiscal consolidation has been widely implemented in recent years.

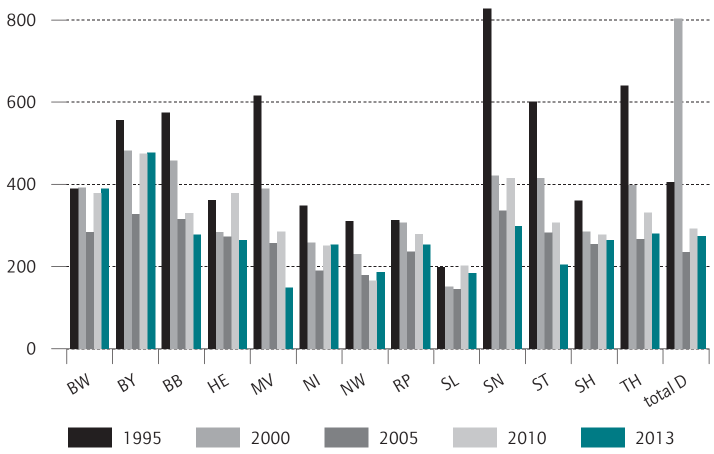
Public investment needs are difficult to quantify

The decline in gross public investment as a share of total economic output and/or the negative trend of investment sums per capita taken alone, however, are still not reason enough to speak of an investment deficit in Germany. In order to establish whether this really is the case, more information is needed both about investment activity and investment needs.

Figure 2

Municipal investment

Per capita, in euros



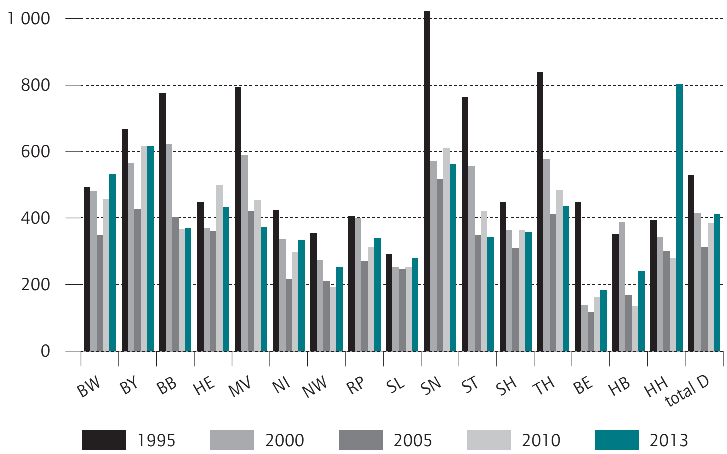
Source: German Federal Statistical Office; calculations by DIW Berlin.

Per-capita investment varies considerably.

Figure 3

Investment by federal state and municipality

Per capita, in euros



Source: German Federal Statistical Office; calculations by DIW Berlin.

Rich federal states invest more than poor ones.

In this context, it is sometimes argued that reducing investment activity is a necessary step, given the changing demand for public services resulting from demographic trends. For example, certain municipal buildings con-

8 This also applies if large-scale projects such as the construction of Munich Airport are discounted.

9 In the city states, revenue and expenditure cannot be allocated to tasks specific to municipality or federal state and the levels can only be considered cumulatively.

10 In 2013, investment spending in Hamburg was higher due to the construction of the Elbe Philharmonic Hall.

11 Both Bremen and Saarland received supplementary federal grants (*Bundesergänzungszuweisungen*) from 1994 to 2004 after the German Federal Constitutional Court determined they were undergoing a budget crisis. Berlin failed to achieve a similar ruling in 2006.

Box

Outsourcing from municipal core budgets

Many would argue that the decline in public investment is due to the substantial outsourcing from core budgets, particularly on the municipal level. In fact, public services were handed over to public funds, institutions, and enterprises (FEUs) or fully privatized in the 1990s, for instance in the field of waste management. The actual extent of outsourcing and investment in outsourced institutions, however, is very difficult to determine.[1] Nevertheless, there is an indication in the annual accounts of public funds, institutions, and enterprises though it may not always be absolutely clear which investments were allocated to "general government" according to the definition used by the national accounts system (*Volkswirtschaftliche Gesamtrechnungen, VGR*).[2] The approximate volume of unrecorded investment can be estimated if investment spending from extra budgets indicated separately in the accounting statistics is deducted from total investment. In 2012, around 50 percent of FEU investment was not allocated to "general government" according to the national account system.[34]

Very little analysis has been conducted on the structure of FEUs. This is because it takes a very long time to obtain the corresponding data from the statistical offices due to the complex process required to generate it. What is clear is that the vast majority of these enterprises can be assigned on the municipal level. In 2008, over 90 percent of FEUs were municipal or owned by the city states of Hamburg and Berlin. A large share (just under 40 percent) are allocated to the industrial sectors water and sanitation, energy supply, and real estate activities. Around 15 percent of FEUs are allocated to "general government" in the national accounts. The industry sectors mentioned above in the field of supply and disposal barely feature at all in "general government." The dominant industry sectors here are those allocated to social security, administration, social services, the arts, and sports.[5]

It is possible to assess balance sheets from 1999 to 2012. Data are therefore missing for the period during which the majority of outsourcing presumably occurred. As a result, it is impossible to estimate the full extent of outsourced investment. Nevertheless, it can be determined whether the decline of net investment by municipalities in the 2000s could have been offset by increased purchases and the construction activities of municipal enterprises.

In fact, considerable investment is made outside the core budgets. In 1999, the government invested 49.5 billion euros and, at 46.6 billion euros, the FEUs invested nearly as much. About 60 percent of investment went into municipal enterprises, funds, and institutions. In 1999, these investments were used to construct buildings and purchase new machinery, equipment, and licenses worth almost 28 billion euros. In 2012, the value at current prices was almost identical. Accordingly, the investment rate of FEUs has declined overall since 1999 (see Figure 1).

In 1999, this investment was offset by depreciations of approximately 18 billion euros, while in 2012 the corresponding figure was 19.3 billion euros. Overall, net investment in municipal FEUs during the period under observation fluctuated between 5 and almost 11 billion euros. By contrast, in 1999, net investment by the central and federal state governments in FEUs rose substantially from 1.5 billion euros (federal states) and 2.8 billion (central government) to 4.8 billion (federal states) and 8.1 billion in central government FEUs (see Figure 2). Overall, in 2012, FEUs probably made a contribution to net investment of around 11 billion euros which was not recorded in the national accounts. This unrecorded investment on the municipal level is likely to have totaled around 4.8 billion euros[6] in 2012 and was, therefore, not enough to compensate for the lack of investment in the core budgets.

1 T. Eberhard, "Öffentliche Investitionsquote – Was wird abgebildet?," DIW-Roundup 74 (2015); P. Haug, "Kommunale Unternehmen als Schattenhaushalte - Wie sieht die tatsächliche Haushaltssituation der deutschen Kommunen aus?," Wirtschaft im Wandel 15(5) (2009): 220–228.

2 According to the German Federal Statistical Office, companies are considered to be "public funds, institutions, and enterprises" (FEUs) if they are in majority, direct, or indirect ownership of core budgets (central government, federal state, municipalities/municipality associations, and statutory social insurance). They are created by outsourcing tasks from the core budgets or by forming new companies or acquiring shares in domestic companies. They may be regulated under both public and private law. However, the ownership structure of these companies is not relevant for classification as public investment in the national accounts. A more decisive factor is that the company is controlled by the government and that it is a non-market producer. In 2008, 2,140 of a total of 14,704 public funds, institutions, and enterprises were assigned to "general government" in the national accounts.

3 Eberhard, "Öffentliche Investitionsquote."

4 Council of Experts for the Assessment of Overall Economic Development, Annual Report 2014/15; N. Schmidt, "Ausgliederungen aus den Kernhaushalten: öffentliche Fonds, Einrichtungen und Unternehmen," Wirtschaft und Statistik (2011): 154.

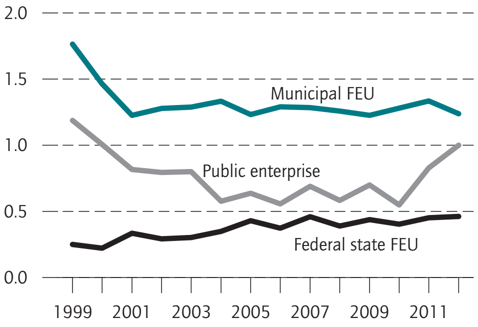
5 Schmidt, "Ausgliederungen aus den Kernhaushalten."

6 A 55-percent share of non-recorded investment is assumed here, see Eberhard, "Öffentliche Investitionsquote."

Figure 1

Investment rate of public funds, institutions, and enterprises (FEU) by municipal authority

Percent of GDP at current prices

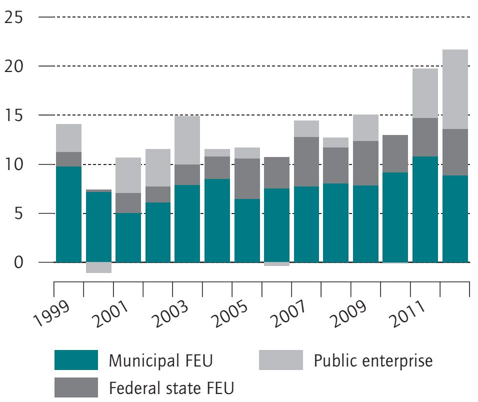


Source: special evaluation by the German Federal Statistical Office; calculations by DIW Berlin..

Figure 2

Net fixed capital investment in public funds, institutions, and enterprises (FEU) by municipal authority

In billions of euros



Source: special evaluation by the German Federal Statistical Office; calculations by DIW Berlin.

structed in the 1970s would no longer be needed today.[12] A decline in investment was therefore the logical consequence of this development.

An assessment of this kind is, however, in clear contradiction to the stated need to expand municipal infrastructure as a result of demographic change. It is certainly not self-evident that an aging population requires less public infrastructure. There is, in fact, substantial evidence that the need to develop the infrastructure in order to make adjustments for an aging population can be significantly higher than for an age structure that remains constant. This applies, for instance, to adjusting network infrastructures when they are used less intensively,[13] making existing buildings[14] more accessible, and/or changes in regional settlement patterns and urban development.

The effect of technical progress on investment needs is similarly equivocal. On the one hand, existing infrastructure can be utilized more efficiently with improved procedures. On the other hand, technological innovations such as digitalization create the necessity to modify existing infrastructure, also in the public sector. It is therefore virtually impossible to quantify specific investment needs using a model. Surveys on investment needs, particularly in municipalities, indicate a need for greater investment.[15]

The depreciation of public infrastructure capital stock is an important point of reference for estimating the appropriate level of investment. Depreciations are calculated mathematically and are intended to reflect the loss of value of an item of infrastructure over its lifetime.[16] They do not represent the actual change in capital stock for the purposes of the national accounts and are not to be interpreted as a directly relevant variable for production potential; the actual asset disposals are relevant in this context.[17] However, many years of negative net investment, i.e., lower gross investment than depreciation, can be taken as an indication that the pub-

12 Council of Experts for the Assessment of Overall Economic Development, *Annual Report 2014/15, Mehr Vertrauen in Marktprozesse* (2014), 237.

13 This refers, *inter alia*, to the decommissioning of water and wastewater networks with a consistently large coverage area but declining numbers of users.

14 M. Eberlein and A. Klein-Hitpaß, *Altengerechter Umbau der Infrastruktur: Investitionsbedarf der Städte und Gemeinden* (Deutsches Institut für Urbanistik, 2012); M. Köller, "Baustelle Kommunen: Demografischer Wandel trifft kommunale Infrastruktur," *KfW Research, Fokus Volkswirtschaft*, no. 30 (2013).

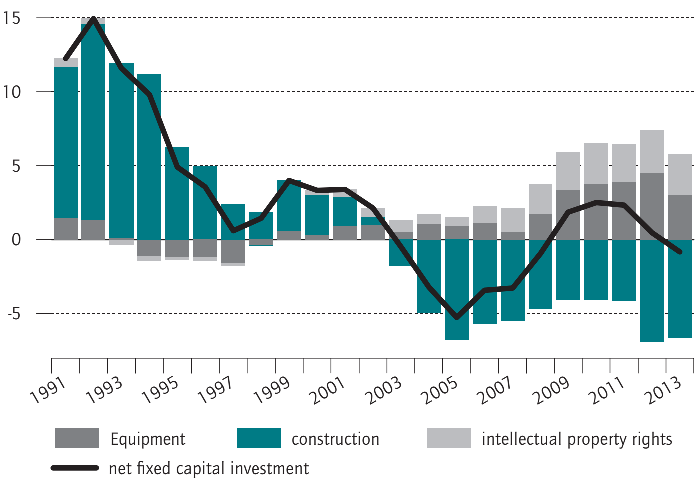
15 KfW-Kommunalpanel 2015. BMWi-Online Befragung „Kommunale Investitionen": https://www.bmwi.de/BMWi/Redaktion/PDF/E/erste-ergebnisse-der-bmwi-online-befragung-kommunale-investitionen,property=pdf,bereich=bmw i2012,sprache=de,rwb=true.pdf

16 German Federal Statistical Office, *Volkswirtschaftliche Gesamtrechnungen – Beiheft Investitionen* (Wiesbaden, 2015).

17 Federal Ministry of Finance (BMF), *Monthly Report* (June 2015).

Figure 4

Net fixed capital investment by the public sector by type of goods
In billions of euros

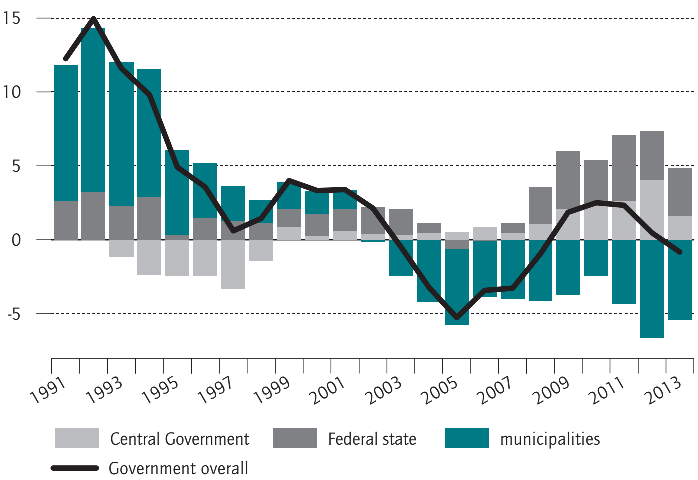


Source: German Federal Statistical Office.

The public sector is living off its assets, particularly in terms of infrastructure.

Figure 5

Net fixed capital investment by the public sector by local authority
In billions of euros



Source: special evaluation by the German Federal Statistical Office; calculations by DIW Berlin.

Particularly investment of municipalities is weak.

lic capital stock is showing signs of depreciation or, at the very least, is outdated.

Consequently, in order to evaluate investment activities, the following section looks at the net and gross investment activities of municipal authorities. Net investment primarily comprises investment spending from the municipalities' core and special budgets. However, investment by the majority of public enterprises is not included.[18] The main trends of net investment by public enterprises are shown in the box.[19]

Public net investment: living off assets

The German Federal Statistical Office reports net investment by sector since 1991. In the 1990s, net investment was clearly positive, mainly due to brisk investment activity in the former East German federal states. It has since fallen and was, in fact, even sometimes negative after the turn of the millennium (see Figure 4). The graph shows in detail that equipment and intellectual property have increased since the early 2000s. However, it is mainly in public non-residential construction that depreciation has exceeded investment since 2003. This picture is consistent with the frequently presented finding that there are considerable investment needs in the field of public infrastructure—in particular for maintaining transport infrastructure.[20]

The graph depicting capital investment by local authority shows that the municipalities in particular have not expanded or maintained their capital stock. Net investment here has been negative since 2003 (see Figure 5).

The central and federal state governments, however, have substantially expanded public capital stock again in recent years. This is likely related to recent growth in investment in intellectual property and the resultant substantial increase in spending on research and development in particular, which is predominantly the responsibility of the federal states.

Conclusion

Investment in public infrastructure is an essential prerequisite for ensuring competitiveness and creating

18 For an explanation of the definitions, see T. Eberhard, "Öffentliche Investitionsquote – Was wird abgebildet?," *DIW-Roundup 74* (2015).

19 For further analyses of the investment activities of public enterprises, see Cullmann et al.

20 Daehre-Kommission, *Bericht der Kommission „Zukunft der Verkehrsinfrastrukturfinanzierung"* (2012); Cologne Institute for Economic Research (Institut der deutschen Wirtschaft Köln), *Infrastruktur zwischen Standortvorteil und Investitionsbedarf* (Cologne: 2014); U. Kunert and H. Link, "Transport Infrastructure: Higher Investments Needed to Preserve Assets," *DIW Economic Bulletin*, no. 10 (2013).

growth potential. Although Germany certainly has a well-developed infrastructure compared to other countries, public investment has undoubtedly declined sharply since the mid-1990s. This applies not only to eastern Germany with its specific reunification-related investment requirements but also to many western German federal states.

In particular, local public infrastructure has been showing signs of wear and tear for many years now. This means that current levels of investment are not sufficient to offset this decline, and the infrastructure is becoming increasingly outdated and limited in its scope. The investment activity of local public enterprises—as shown in the box—has been rather subdued in recent years and was not able to compensate for the lack of investment in municipal budgets.

In order for this backlog of local public investment to at least not continue growing, a rapid change in policy is urgently needed. Comprehensive structural measures are essential to ensure the possibility of growth-oriented investment activity by municipalities in the medium term. The Investment Commission (*Investitionskommission*) at the Federal Ministry for Economic Affairs and Energy (BMWi) has provided much food for thought on this issue.[21]

It is hardly surprising that the more relaxed the financial situation is, the higher the (municipal) investment. As a result, the investment needs in financially weak municipalities are particularly high. It was, therefore, a step in the right direction for the central government to set up a special fund this year aimed at encouraging investment in financially weak areas up to 2019. Ultimately, however, this is only a one-off payment and not a systematic approach to solving the problem.

One additional improvement might be to take proper account of the financial weakness of the municipalities in fiscal equalization among the federal states. The reorganization of central government and federal state finances from 2020 is currently being negotiated. The federal state fiscal equalization system does not sufficiently take account of the financial strength of each municipality. Only 64 percent of municipal tax revenues are considered when comparing taxable capacity across the federal states. Financially weak municipalities rely considerably more on sufficient funding from municipal financial equalization. This means by implication that cash-strapped federal states have to set aside more resources for financial transfers to their municipalities. If fiscal equalization took account of all municipal tax revenues, the cash-strapped federal states would be in a better position to make sufficient funds available to their municipalities, making it more probable that they would have surplus funds for investment.

21 It is recommended that, among other things, a National Investment Pact is created for municipalities to improve funding, that infrastructure companies are set up for municipalities to increase consulting skills, and that public partnerships are strengthened. See Federal Ministry for Economic Affairs and Energy (BMWi). (2014) Stärkung von Investitionen in Deutschland, Bericht der Expertenkommission, Berlin

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