

# Risk of lagging behind: Germany's persistent public sector under-investment

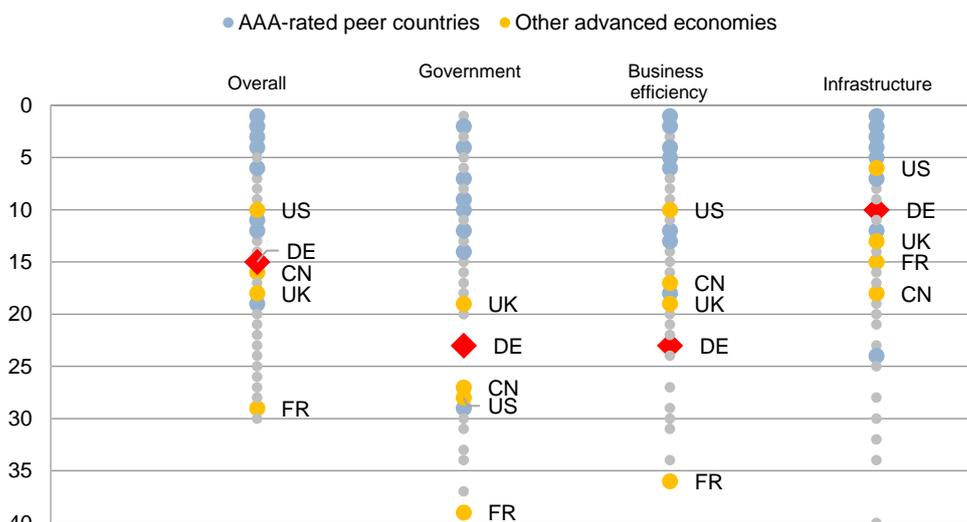


The pandemic has highlighted several important aspects of Germany's investment gap, the result of persistent public sector under-investment in recent decades. We estimate the investment gap at around EUR 410bn, or 12% of GDP. Public investment can create jobs and is a highly effective way of increasing an economy's growth potential, partly by maintaining competitiveness through improved productivity which, in Germany's case, would counteract the decline in the working-age population. The focus over the next years should be education and supporting Germany's transition to a digital and green economy through targeted spending and supportive policies.

The Covid-19 pandemic had a disruptive impact on Germany's economy and highlighted several shortcomings, in areas such as education and digitalisation, resulting from Germany's persistent under-investment in recent decades. Driven by the Maastricht Treaty and a national focus on maintaining a balanced budget, or "Black Zero" policies, public sector priorities remained centred on debt reduction in the decade after the global financial crisis (GFC). This has resulted in estimated cumulative under-investment of around EUR 410bn (12% of 2019 GDP) since the GFC, using other highly rated economies as a benchmark.

While the German economy remains highly competitive, it has fallen behind other AAA-rated countries (Figure 1), particularly on measures of government and business efficiency. The financing provided by the EU Recovery and Resilience Facility (EUR 25.6bn in grants) will support investment and reform in important economic sectors but needs to be topped up with a more ambitious reform agenda to maintain Germany's competitiveness. The pledges by the major political parties ahead of the upcoming federal election to boost investment over the next decade are promising. Any new coalition government will need to balance funding for long-term investment while maintaining fiscal discipline.

Figure 1: IMD World Competitiveness ranking 2021 – Top 30 country rankings



Source: IMD World Competitiveness Yearbook, Scope Ratings GmbH  
 Note: Germany's AAA-rated peers include Austria, Luxembourg, Netherlands, Norway, Sweden, Switzerland

**Our main takeaways are:**

- Three areas where Germany risks lagging behind other highly rated economies are education, digitalisation, and the transition to a carbon-neutral economy.
- If implemented in time, investments and reforms have the potential to maintain Germany's competitiveness and enhance future growth. The EU's Recovery and Resilience Facility could help to accelerate reforms.

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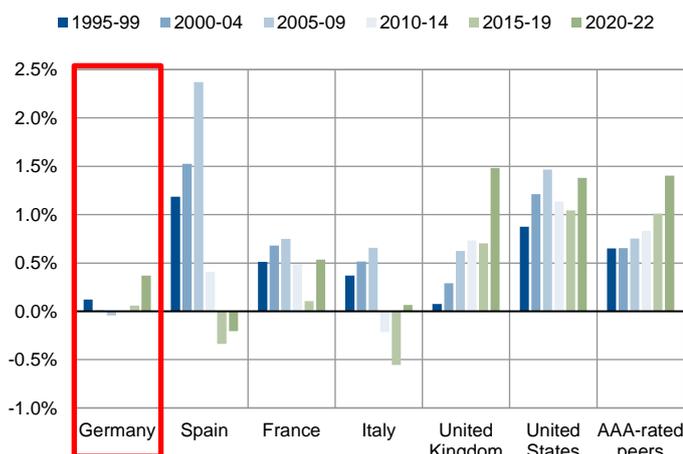
## Persistent low levels of investment

### Low levels of public investment over the past 25 years

Germany's persistent low levels of public investment are clearly illustrated when comparing net fixed capital formation across advanced economies (**Figure 2**). This measure incorporates assets used in production processes and includes tangible assets such as buildings, roads, machinery and equipment in addition to intangible assets such as computer software and patents, while taking account of depreciation. On average, public investment was sufficient to maintain a stable capital stock over the past 25 years, though public investments started to increase briskly in the run-up to the pandemic and have since continued to increase (**Figure 3**). In contrast, many advanced economies including France, the United Kingdom, the United States and Germany's AAA-rated peers have focused on consistently growing their capital stock through public-sector investment. Exceptions among advanced economies include Spain and Italy where investment spending fell over the past decade as part of fiscal consolidation in response to the European debt crisis.

**Figure 2: Public sector investment: net fixed capital formation since 1995**

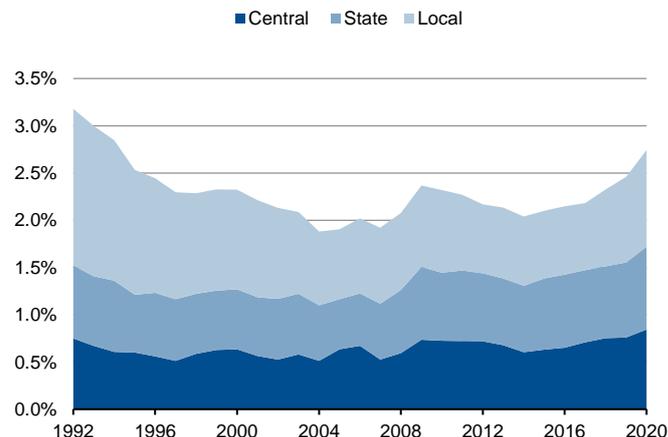
% of GDP



Source: European Commission, Scope Ratings GmbH

**Figure 3: Gross fixed capital formation**

% of GDP



Source: Statistisches Bundesamt, Scope Ratings GmbH

### Debt brake helped to place debt levels on a downward trajectory

Germany has maintained strict fiscal discipline following the rise in public sector debt after the global financial crisis. Federal and state debt-brake laws, introduced in 2009 for the Bund and binding for the state governments since 2020, limit structural deficits to 0.35% of GDP a year, and to 0% for state governments. This has helped to place Germany's general government debt on a clear downward trajectory since the financial crisis. The Bund activated the general escape clause of its debt brake last year in response to the pandemic, which it is expected to apply again from 2023.

### Germany's investment gap estimated at around 12% of GDP

The strong focus on reducing public sector debt has contributed to the long-term low level of investment. This is despite public investment in Germany being highly effective with every euro of public spending generating on average 1.5 euros of private sector investment.<sup>1</sup> We estimate Germany's investment gap vis-a-vis its AAA-rated peers since 2008 at around EUR 410bn (12% of 2019 GDP).<sup>2</sup> Other forward-looking estimates indicate an investment gap of EUR 330bn – 450bn over the ten years to 2030.<sup>3</sup> These are not

<sup>1</sup> BMF Monatsbericht, *Öffentliche Investitionen als Triebkraft privatwirtschaftlicher Investitionstätigkeit*, April 2021.

<sup>2</sup> The investment gap of EUR 410bn is calculated by comparing Germany's cumulative net public fixed capital formation as a percentage of GDP with the average for AAA-rated peers since the Global Financial Crisis in 2008, just before the introduction of Germany's debt brake law.

<sup>3</sup> DIW, *Öffentliche Investitionen als Triebkraft privatwirtschaftlicher Investitionstätigkeit*, p.77, December 2020.

### Major political parties recognise the need for higher investment

insurmountable amounts, but likely to be challenging to meet through budget re-allocations given rising spending pressures in view of the country's demographic profile.

All major political parties have recognised the importance of increasing public investment in their manifestos ahead of the Federal elections in September. The parties of the ruling coalition (CDU/CSU and SPD) are committing to raise R&D expenditure to 3.5% of GDP until 2025, which translates into a very gradual increase from 3.2% of GDP in 2019. There are also commitments to increase internet speed and accessibility, particularly in rural areas, to help support the important SME sector. The CDU made several specific commitments including an additional EUR 15bn investment by 2025 to achieve full 5G coverage across Germany, build a quantum computer and support artificial intelligence projects. The most ambitious investment plan comes from the Greens who plan to spend an additional EUR 50bn a year for the next 10 years to finance a broad range of initiatives.

### Balance between funding higher productive investment needs and fiscal discipline will be key

The commitments made in the manifestos address the areas most closely related to the investment gap. However, it is unclear how some of the commitments would be funded. While the CDU intends to prioritise achieving a balanced budget as soon as possible, the Greens want to enable their EUR 500bn investment plan through a reform of the debt brake by complementing it with an investment rule. While details of the Green's investment plan remain scarce, it could significantly contribute to the closing of Germany's investment gap. Initial studies<sup>4</sup> indicate that the scale of the plan would raise GDP by around 4% by 2040, without resulting in a permanent increase in public sector indebtedness as a percentage of GDP. However, in practice, politically motivated spending pledges will need to be matched with economically possible investment opportunities that enhance long-term productivity. Germany's debt brake will remain an important anchor to ensure fiscal discipline. At the same time, the demographic challenges mean that Germany's potential growth is likely to fall unless productivity and competitiveness improve. Policy makers should explore different options for funding such an investment drive, possibly channelling the funding through a regional development bank or separate investment vehicle to address the shortfall. Some estimates suggest that this approach, in combination with a relaxation of EU fiscal rules, could elicit additional investment of around EUR 222bn until 2030. Other proposals include not repaying pandemic-related debts (freeing up around EUR 108bn) or delaying the re-implementation of the debt brake by 5 years (freeing up around EUR 216bn).<sup>5</sup> However, the last two options would require amending the German constitution, a task which some lawmakers would oppose.

### Education sector: an increasing investment gap

The latest PISA study carried out in 2018 showed that Germany's student performance was above the OECD average and broadly in line with its AAA-rated peers. On average, total current spending per student is also similar to other major economies. However, a significant investment gap has emerged driven by regional disparities, long-term under-investment in schools and an ageing teacher cohort.

### Long-term under-investment has resulted in a EUR 47bn gap

Most of the funding for primary and secondary schools comes from the German regions and municipalities rather than the federal government. This results in large funding disparities between the regions ranging from EUR 7,200 per student in North Rhine-Westphalia to EUR 11,300/student in Berlin. Municipalities have increased their investments over the past three years, reaching EUR 10bn in 2020 and expected to reach

<sup>4</sup> IMK Kommentar: Investitionspläne der Grünen: Keine Gefahr für Deutsche Schuldenragfähigkeit, June 2021.

<sup>5</sup> IMK Policy Brief, Finanzpolitische Spielräume bei unterschiedlichem Umgang mit der Schuldenbremse, July 2021.

## ICT skills and infrastructure has fallen behind AAA-rated peers

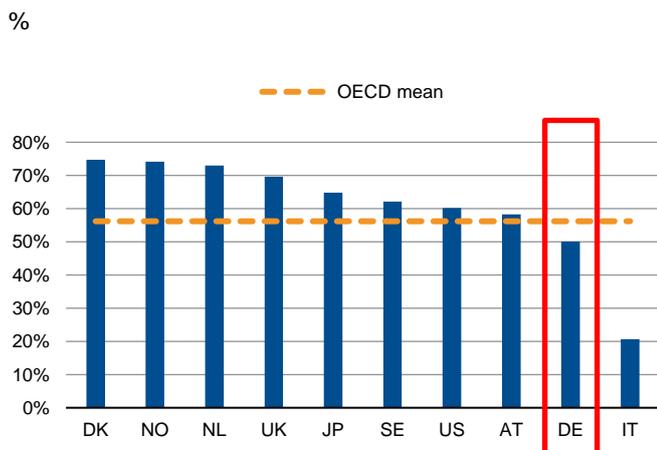
## Ageing teacher cohort to lead to large staff shortfalls

EUR 11bn in 2021. However, the estimated outstanding investment gap for schools remains high at EUR 47bn.<sup>6</sup>

The sudden rise in remote learning during the pandemic also highlighted the lack of digitalisation in schools. In response, the government extended an existing investment initiative of EUR 6.5bn over five years by an additional EUR 1.5bn to fund IT support staff and provide IT equipment to students and teachers.<sup>7</sup> While these initiatives are urgently needed, they are not sufficient to address the large investment gap. German teachers' ICT skills remain below the OECD average and the percentage of students with internet access in the classroom (**Figure 4**) remains significantly below other AAA-rated countries. For the school system to remain competitive, and to help address skill shortages in the workforce, such large investment gaps will need to be reduced.

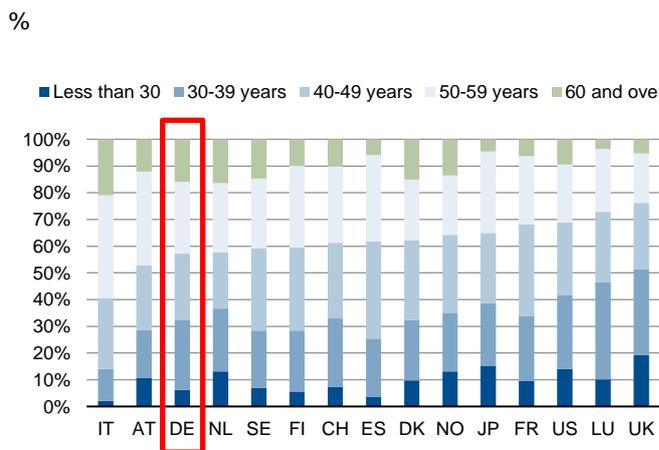
Germany's ageing teacher cohort and rising pension costs also place structural pressure on the governments' expenditure flexibility. While other developed economies face similar risks, Germany stands out with 42% of secondary school teachers aged 50 or over (**Figure 5**) compared with other advanced economies such as Denmark (38%), Norway (36%) and the UK (24%). Despite above-average starting salaries, few young people decide to become teachers due to a broad decline in the profession's attractiveness.<sup>8</sup> The potential staff shortfall is estimated at around 200,000 by 2030. Attracting younger teachers to the profession could also facilitate the teaching of digital skills in schools.

**Figure 4: Students with Internet access in the classroom**



Source: OECD, Scope Ratings GmbH

**Figure 5: Secondary education: share of teachers by age**



Source: OECD, Scope Ratings GmbH

## Strong reliance on oil & gas sector remains

## Other advanced economies are seeing faster progress

## Transitioning towards a carbon neutral economy

Keeping pace with the broad-based shift towards low carbon economies can help to reduce transition risk and enhance long-term growth prospects. The ruling of Germany's Constitutional Court to enhance carbon emission reduction plans, especially until 2030, has prompted the government to bring forward its climate neutrality goal to 2045 from 2050. To date, Germany remains heavily reliant on fossil fuels which still accounted for 76% of primary energy consumption in 2020, which compares to around 62% for similar countries.

The Paris climate target of a 40% carbon emission reduction from 1990 levels by 2020 was met, although helped by widespread pandemic-related economic shutdowns in the spring of 2020. The ambitious targets until 2030 and 2045 will require continued, rapid structural

<sup>6</sup> KfW-Kommunalpanel 2021, May 2021.

<sup>7</sup> DigitalPakt Schule, Bundesministerium für Bildung und Forschung

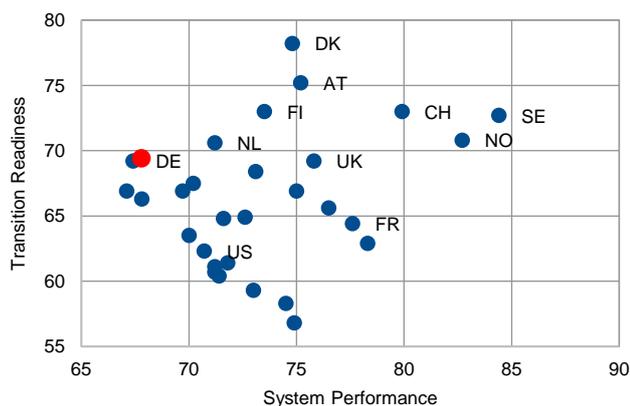
<sup>8</sup> Deutscher Lehrerverband, *Thesen und Forderungen zur Bekämpfung des Lehrkräftemangels in Deutschland*, March 2019.

changes to keep up with other highly rated economies. Germany ranks 18<sup>th</sup> within the World Economic Forum's Energy Transition Index<sup>9</sup> and thereby remain well behind other AAA-rated sovereigns, which occupy all top-5 ranks, and behind other advanced economies such as the UK (7<sup>th</sup>) and France (9<sup>th</sup>) (**Figure 6**). Since 2012, Germany's score has also remained almost unchanged (+0.2) while peer countries (averaging +1.6), France (+1.7) and the UK (+2.0) increased their lead.

### A supportive policy environment for the private sector is crucial

There are large uncertainties when estimating the public investment requirements specifically related to a low-carbon economy transition. All the main economic sectors, such as manufacturing and energy, are impacted (**Figure 7**) and the share of private investment will be influenced by the wider policy framework. Previous studies have suggested a total required investment volume in the range of EUR 1.7trn to 2.3trn until 2050.<sup>10</sup> Under the assumption that on average 15% of the costs would fall to the public sector, additional investments of EUR 7.5bn – 10.2bn per year would be needed (less than 0.5% of 2019 GDP). This underlines the importance of the private sector and the need to ensure a favourable policy environment including tax incentives, effective carbon taxes and simplified planning laws.

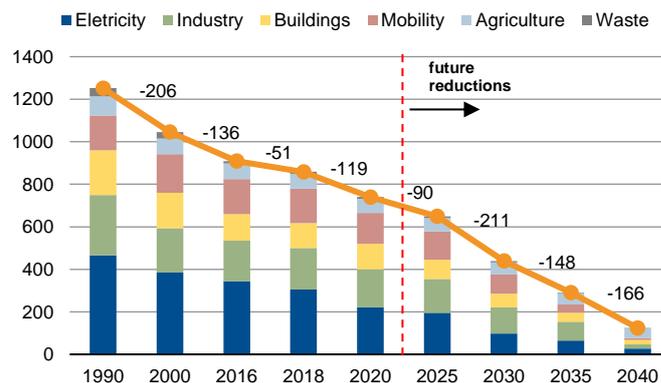
**Figure 6: Energy Transition Index: transition readiness vs system performance**



Source: World Economic Forum, Scope Ratings GmbH

**Figure 7: Emission reductions needed by sector to achieve Germany's 2045 net zero target**

million CO2 tones p.a.



Source: Prognos, Öko-Institute, Wuppertal Institute, Scope Ratings GmbH

## Digital transition

### Germany's digital transition needs significant further investment

Germany risks falling behind in its digital transition, which has been significantly accelerated globally by the Covid-19 crisis. Significant investment and policy action is required to close the gap to other highly rated advanced economies. Low prevalence of digital skills in the society and weaknesses in digital infrastructure inhibit wider use of digital solutions by businesses, households and public administration.

### Businesses face shortages of digitally skilled labour

Germany's labour force features a relatively low share of digitally savvy workers. In the European Commission's Digital Economy and Society Index (DESI), Germany scores below similar countries (**Figure 8**). The DESI measures the prevalence of at least basic internet skills and the share of ICT specialists in the workforce (Germany 3.9% vs peer

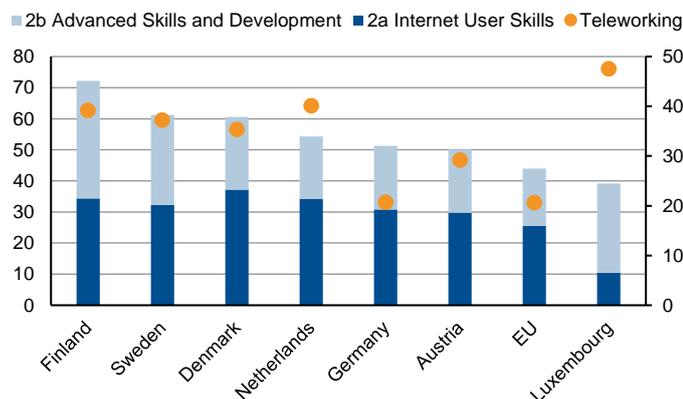
<sup>9</sup> The World Economic Forum's Energy Transition Index (Figure 6) measures countries' system performance which focusses on the sustainability and reliability of the energy transition, and their transition readiness which focusses on the stability of the policy environment, investment climate, level of consumer engagement and the adoption of new technologies.

<sup>10</sup> IW Policy Paper 10/19, Für eine solide Finanzpolitik: Investitionen ermöglichen!, November 2019.

average of 5.3%) as well as ICT graduates. A shortage of digitally skilled workers is a bottleneck for further digitalisation of the economy, with a recent KfW study finding that almost 40% of German SMEs are unable to recruit sufficiently skilled workers for their digitalisation projects.<sup>11</sup> This is economically relevant, as SMEs in Germany contribute a high share of gross value added (42% of total) and are an important driver of business R&D (12% of total).

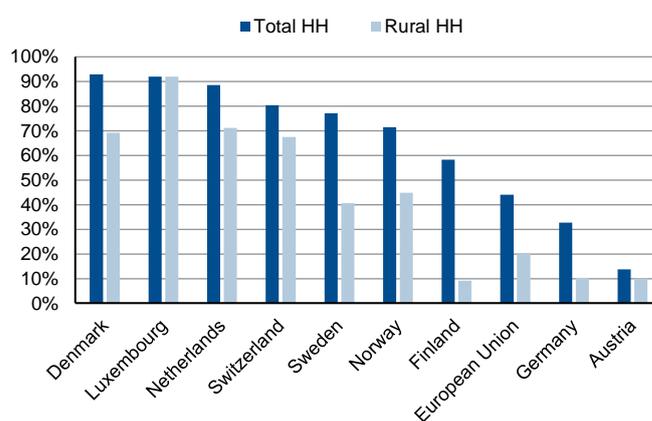
The country also performs relatively poorly when it comes to remoting working – working from home (WFH) - with only 21% making use of WFH regularly or occasionally compared with an average of 38% in 2020 (**Figure 8**) in similar economies in Europe. Use of WFH has dramatically increased due to the pandemic, with some evidence of its potential to increase productivity.<sup>12</sup>

**Figure 8: DESI digital skills ranking and teleworking, 2020**  
Index (1-100, lhs), and employed persons working from home regularly or occasionally, % of total employment (rhs)



Source: European Commission, Eurostat, Scope Ratings GmbH

**Figure 9: Overall Fixed Very High Capacity Network (VHCN) coverage**  
% of households



Source: Broadband Coverage in Europe in 2018, Scope Ratings GmbH

## Investment needed for more widespread high-speed broadband access

Germany's digital infrastructure will require significant investment to catch up with its European peers. The share of households with access to very high-capacity networks is, at 33%, only half of the peer group average of 67%. The gap is even larger for households in rural areas (10% vs peer average of 46%) (**Figure 9**). Uneven connectivity increases the risk of exclusion of significant parts of the population and the economy from more advanced digital solutions, including distance learning. The lack of sufficient digital infrastructure presents the biggest obstacle to implementing further digital solutions for SMEs.<sup>13</sup>

## R&D concentrated in the automotive sector

Despite an overall high share of R&D spending compared to other EU countries, at 3.1% of GDP in 2018 vs 2.7% for the peer group average, German corporate R&D activity is heavily concentrated in manufacturing, specifically automotive and pharmaceutical. While high R&D investment in manufacturing is vital to sustain Germany's highly competitive industrial sector, investment in other fields, such as AI and machine learning, has lagged behind too. Germany ranked behind the US, Switzerland, Sweden and the Netherlands in the adoption of frontier technologies in 2021, according to the UN.<sup>14</sup>

<sup>11</sup> KfW, [Lack of digital skills is hampering German SMEs' digitalization efforts](#), February 2020.

<sup>12</sup> NBER working paper series, working paper 28731, [Why working from home will stick](#), April 2021.

<sup>13</sup> KfW, [European SME Survey 2019, Going Digital: The challenges facing European SMEs](#), p 42.

<sup>14</sup> United Nations, [Technology and Innovation Report 2021](#)



## Risk of lagging behind: Germany's persistent public sector under-investment

Germany's Recovery and Resilience plan step in the right direction, needs to be complemented by national resources

One way to maintain Germany's industrial competitiveness is to invest in digital skills of the workforce and ensure high-speed connectivity across the country. More than half of the EUR 25.6bn in EU grants in Germany's Recovery and Resilience plan are earmarked for the digitalisation of the economy, infrastructure and education. However, the funds are small in proportion to the size of Germany's economy at just 0.7% of 2019 GDP so the government needs to find ways to top them up to close the digital gap with China, US and advanced European economies.



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