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**Article**

## Productivity growth in decline despite increasing workforce qualifications

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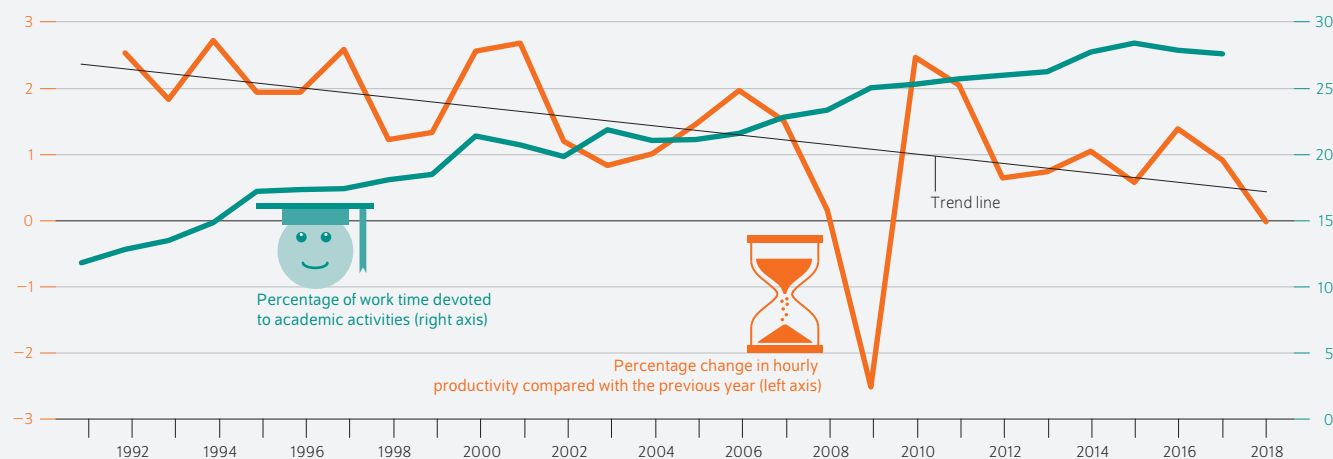
AT A GLANCE

## Productivity growth in decline despite increasing workforce qualifications

By Karl Brenke

- Labor productivity in Germany and other developed economies is developing increasingly slowly
- Growth is at odds with the improving qualifications of the workforce: academization progressing, share of low-skilled jobs decreasing
- Sectoral change contributing to slow labor productivity growth but can only partly explain the observed slowdown
- Increasing bureaucracy in the working world could also have a negative influence
- Employment structure has changed: Jobs that involve bureaucratic activities have gained in importance

Productivity growth declining despite the workforce's increasingly higher qualifications



Source: Federal Statistical Office; SOEP v34; author's own calculations.

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FROM THE AUTHORS

*“The decade-long downward trend in productivity growth is a key problem for developed economies. Increasing bureaucratization in the working world has hardly been considered as a factor so far. What is striking, however, is that while productivity growth has declined, the share of jobs with management and leadership functions and those which apply laws and regulations has increased significantly.”*

— Karl Brenke, study author —

# Productivity growth in decline despite increasing workforce qualifications

By Karl Brenke

## ABSTRACT

After developing at an increasingly slower pace over the decades, labor productivity in Germany has recently stagnated. This is in contrast to the development of the workforce's qualifications, which have been growing steadily due to rapid academicization. These phenomena can be found in other developed countries and are often attributed to sectoral change. Indeed, the shift of economic activity towards services has hampered productivity growth since the turn of the millennium, but not to a large extent. Picking up on a debate in the USA, this report looks at bureaucratization trends. For example, an analysis of German data from the European Labour Force Survey shows that jobs vital to bureaucracies have gained in importance in Germany, one possible reason for low productivity growth. Further research is needed to determine whether this link can be empirically proven and to what extent this development has contributed to the slowdown in productivity growth.

The German Council of Economic Experts (*Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung*, SVR) previously indicated a slowdown in labor productivity growth in 2015.<sup>1</sup> In 2016, it was decided that “national productivity boards”<sup>2</sup> to develop policies to improve the productivity and competitiveness of EU countries should be established EU-wide. The SVR was named the national productivity board for Germany. Since then, considerable attention has been paid to productivity growth in science and politics. In contrast, little attention has been paid to the public perception of and debate surrounding productivity growth.

This report shows developments in the working world that could affect labor productivity. Data from the official national accounts and household surveys were used; the latter have been partly evaluated by the author. The analysis is primarily exploratory in nature.

## Productivity increases growing smaller

According to the long-term trend, labor productivity in Germany is growing at an ever slower pace (Figure 1) despite possible shortcomings in statistical coverage.<sup>3</sup> The value added per gainful worker has developed particularly weakly, which is also due to an increase in part-time work. Hourly productivity has also been declining and most recently has hardly grown at all: In 2018, it stagnated in real terms and the *Institute der Gemeinschaftsdiagnose* expect a slight decline in 2019.<sup>4</sup>

<sup>1</sup> Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung, “Zukunftsfähigkeit in den Mittelpunkt,” Jahresgutachten 2015/26, 283ff (in German; available online, accessed on August 2nd, 2019; This applies to all other online sources in this report unless stated otherwise).

<sup>2</sup> Cf. European Union, “Council Recommendation of 20 September 2016 on the establishment of National Productivity Boards,” *Official Journal of the European Union* 2016/C 349/01 (available online).

<sup>3</sup> Cf. Martin Ademmer et al., “Produktivität in Deutschland – Messbarkeit und Entwicklung,” *Kieler Beiträge zur Wirtschaftspolitik* no. 12 (2017) (in German).

<sup>4</sup> By 0.2 percent. Cf. Projektgruppe Gemeinschaftsdiagnose, *Konjunktur deutlich abgekühlt – Politische Risiken hoch* (Halle (Saale), 2019), 76 (in German, available online).

Data from previous decades can be used to view long-term developments.<sup>5</sup> In the 1970s, the average annual increase in hourly productivity was almost four percent; in the eight years since 2010, it was only 0.9 percent (Table 1).

A similar development can be observed in other countries, although long time series are only available for a few. The situation in France and Finland is similar to that in Germany. In Poland, productivity growth has been relatively high in recent years, but has declined compared to the previous decade. Productivity growth was particularly weak in Italy, where it has been so since the 2000s. The situation is different in the United States: Labor productivity growth picked up in the 1990s and 2000s after a temporary slowdown in the previous two decades, only to have declined sharply once more recently.

### Workforce's qualifications improving

The cause of declining productivity growth is likely due to the qualifications of the workforce, which have been increasing significantly. In Germany, the EU countries, and other developed countries, for example, the degree of academicization has been growing rapidly. Increasingly more individuals have a university degree at an age where they are expected to have only completed vocational training (Table 2).

This development will continue. For example, the share of university-educated individuals is far greater amongst 25 to 34-year-olds than amongst the working-age population. In Germany, too, the share of individuals ending their secondary education with an *Abitur* (certificate of general qualification for university entrance) or *Fachhochschulreife* (advanced technical college entrance qualification) is growing. In 2017, it was 37 percent, up from 25 percent in 1993.<sup>6</sup> However, the share of those in any age cohort with a higher education entrance qualification is even higher, especially because it is often acquired in a vocational school. According to the Standing Conference of the Ministers of Education and Cultural Affairs, half of any age cohort already had a higher education entrance qualification in 2014.<sup>7</sup>

The share of individuals without vocational training has developed inversely to the highly educated and has declined in almost all EU countries (Table 3).<sup>8</sup> In some countries, it is well below ten percent—such as in some Eastern European countries, where education has been valued highly since socialist times. The share of low-skilled workers has declined sharply in Southern European countries but remains far above the EU average.

<sup>5</sup> Productivity growth generally depends strongly on economic trends. In this respect, analyzing decades individually can lead to ambiguities. At least in the case of Germany, however, there was almost always an economic upswing at the beginning or end of a decade.

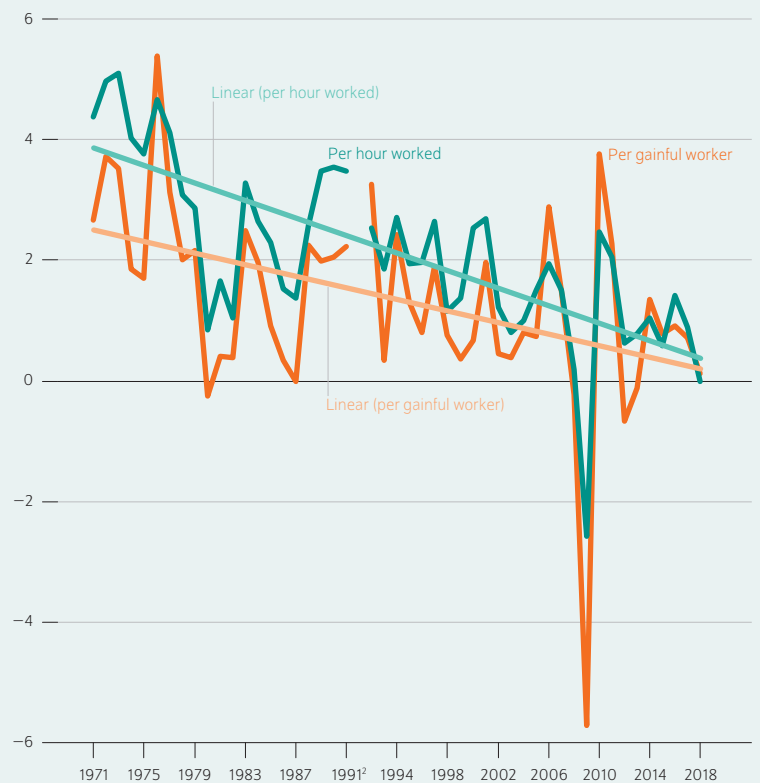
<sup>6</sup> Cf. Statistisches Bundesamt, "Allgemeinbildende Schulen. Schuljahr 2017/18," *Fachserie 11, Reihe 1* (2018) (in German).

<sup>7</sup> Cf. information on access to higher education on the website of the Standing Conference of the Ministers of Education and Cultural Affairs (in German).

<sup>8</sup> Estonia is the sole exception. As the data come from the European Labour Force Survey, some of the results for smaller countries may be distorted because the selected samples are not large.

Figure 1

### Labor productivity<sup>1</sup> growth in Germany Change compared to the previous year in percent



<sup>1</sup> Measured in terms of real GDP

<sup>2</sup> Pre-unification German federal states until 1991, unified Germany starting in 1992

Source: Federal Statistical Office; author's own calculations.

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The productivity growth trend in Germany has been downward since the 1970s.

Table 1

### Change in real labor productivity Annual average change in percent

	Germany <sup>1</sup>	EU-28	France	UK	Italy	Poland	Finland	USA <sup>2</sup>
<b>GDP per gainful worker</b>								
1960 to 1970								2.8
1970 to 1980	2.6							1.3
1980 to 1990	1.5		1.8				2.5	1.7
1990 to 2000 <sup>3</sup>	1.3		1.2				2.7	2.3
2000 to 2010	0.6	0.6	0.6	0.8	-0.7	2.7	0.5	2.4
2010 to 2018	0.7	0.7	0.6	0.6	-0.2	2.1	0.4	0.8
<b>GDP per hour worked</b>								
1960 to 1970								3.1
1970 to 1980	3.8							1.9
1980 to 1990	2.3		2.8				2.8	1.8
1990 to 2000 <sup>3</sup>	2.1		1.6				2.8	2.3
2000 to 2010	1.2	0.9	0.8	1.2	-0.2	2.8	1.0	2.7
2010 to 2018	0.9	0.9	0.9	0.3	0.2	2.2	0.7	0.8

<sup>1</sup> Former German federal states until 1990

<sup>2</sup> Business sector

<sup>3</sup> Germany from 1991 to 2000

Source: Federal Statistical Office; Eurostat; US Bureau of Labor Statistics; DIW Berlin calculations.

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Table 2

**Share of individuals with tertiary education in the population and workforce**  
In percent

	Population				Workforce	
	1991	2000	2017		2000	2018
	25 to 64 years old	25 to 64 years old	25 to 64 years old	25 to 34 years old	25 to 64 years old	
Austria		24.5	32.4	40.3	17.4	36.6
Belgium	19.6	27.1	40.3	45.7	34.3	47.9
Czech Republic		11.0	23.9	33.8	13.6	25.7
Denmark	18.3	25.8	39.2	46.6	28.8	42.9
Estonia		28.7	39.7	43.0	34.5	43.5
Finland		32.6	44.3	41.3	37.2	49.2
France	15.1	21.6	35.2	44.3	25.8	42.6
Germany	21.8	23.5	28.6	31.3	28.4	31.8
Greece	11.0	17.7	31.0	42.5	21.5	37.8
Hungary		14.0	24.1	30.2	18.4	28.0
Ireland	15.9	21.6	45.7	53.5	27.0	53.0
Italy	6.1	9.4	18.7	26.8	13.0	23.8
Latvia		18.2	33.9	41.6	22.2	38.6
Lithuania		41.8	40.3	55.6	49.0	47.2
Luxembourg		18.3	40.3	51.4	22.3	49.6
Netherlands	19.6	23.4	37.2	46.6	28.1	42.7
Poland		11.4	29.9	43.5	15.1	37.1
Portugal		8.8	24.0	34.0	10.7	28.3
Slovakia		10.4	23.1	35.1	13.5	27.1
Slovenia		15.7	34.3	44.6	19.1	37.4
Spain	9.9	22.7	36.4	42.6	28.8	43.7
Sweden	25.2	30.1	41.9	47.4	32.2	46.0
UK		25.7	45.7	51.6	31.9	46.6
EU <sup>1</sup>		19.5	31.5		23.8	36.9
Australia	31.2	27.5	45.4	52.0		
Canada	28.3	40.1	56.7	60.9		
Japan		33.6	51.4	60.4		
Mexico		14.6	17.4	22.6		
South Korea		23.9	47.7	69.8		
Switzerland	20.3	24.2	42.6	50.1	23.6	41.6
USA	23.7	36.5	46.4	47.8		
OECD		22.3	36.9	44.5		

1 Not including Croatia

Source: OECD; Eurostat; author's own calculations.

The SVR explains weak productivity growth in Germany is due to the “successful integration of less productive workers into the labor market since 2005.”<sup>9</sup> In fact, however, according to data from the Socio-Economic Panel (SOEP), the share of the volume of work accounted for by jobs that do not require vocational training fell up until 2010. Since then it has stagnated and remains at 20 percent. In contrast, academic jobs are increasing in importance: In 2017, 28 percent of weekly work hours were accounted for by such positions compared to the mid-1980s, when the figure was around 10 percent (Figure 2).

A significant increase in the educational level of the population and the workforce should positively affect overall economic productivity. However, because there is no visible link between changes in qualifications and productivity growth,<sup>10</sup> other factors must be at play as well.

**Sectoral change is slowing productivity growth minimally**

Since labor productivity varies strongly between economic sectors, sectoral change could influence overall economic productivity growth; the economic structure shifting towards less productive sectors over time hinders overall economic productivity growth.

Indeed, in Germany, some low-productivity sectors have experienced comparatively strong employment growth and have thus gained in importance, including health and social services<sup>11</sup> and other business services, primarily temporary agency work (Table 4). At the same time, some sectors with relatively high productivity have lost in importance, such as parts of the manufacturing industry, the energy industry, and financial services.

However, there have also been structural shifts in the other direction that are driving productivity growth. Over the last two decades, highly productive sectors such as IT service providers, freelance and technical service providers, and research and development have become increasingly important, as has the media industry. In contrast, below-average productive areas such as agriculture, trade, or private households have continued to lose importance in terms of employment.

Thus, the link between sectoral change and productivity growth is not clear. For this study, a shift-share analysis is used, which is based on the assumption that there has been no sectoral change at all. The assumption is therefore that the structure of the workforce and the hours worked has not changed over time (Box 1).

9 Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung, “Zukunftsfähigkeit in den Mittelpunkt,” 283 (in German).

10 If the change in the share of academics and the change in hourly productivity for the years 2000 and 2018 is compared for the EU countries (excluding Croatia), the R2 is 0.0029.

11 Cf. Karl Brenke, Thore Schlaak, and Leopold Ringwald, “Social services: a rapidly growing economic sector,” *DIW Weekly Report* no. 15+16 (2018) (available online).

Table 3

**Percentage of individuals aged 25 to 64 without vocational training in the workforce**  
In percent

	2000	2009	2018
Austria	17.7	13.4	10.5
Belgium	31.4	20.2	13.9
Bulgaria	21.4	14.3	10.9
Cyprus	32.8	23.2	14.4
Czech Republic	9.0	5.1	3.9
Denmark	16.0	21.0	14.3
Estonia	8.9	7.3	8.7
Finland	21.6	13.6	7.7
France	30.3	23.5	14.9
Germany	13.8	10.6	10.0
Greece	43.0	33.7	21.3
Hungary	17.7	11.4	11.2
Ireland	34.1	20.9	11.7
Italy	44.8	36.5	30.5
Latvia	10.5	9.2	6.9
Lithuania	8.4	4.7	3.1
Luxembourg	32.7	19.0	17.3
Malta	72.9	56.4	37.7
Netherlands	26.8	22.8	16.3
Poland	13.5	7.4	4.4
Portugal	77.7	66.1	45.1
Romania	28.8	20.6	16.5
Slovakia	7.6	3.9	4.2
Slovenia	18.9	12.1	7.9
Spain	53.0	39.7	32.9
Sweden	19.2	15.6	10.8
United Kingdom	30.2	19.6	16.1
EU <sup>1</sup>	28.5	21.6	16.6
Norway	11.5	15.7	12.9
Switzerland	14.7	10.7	9.6

1 Not including Croatia

Source: Eurostat; author's own calculations.

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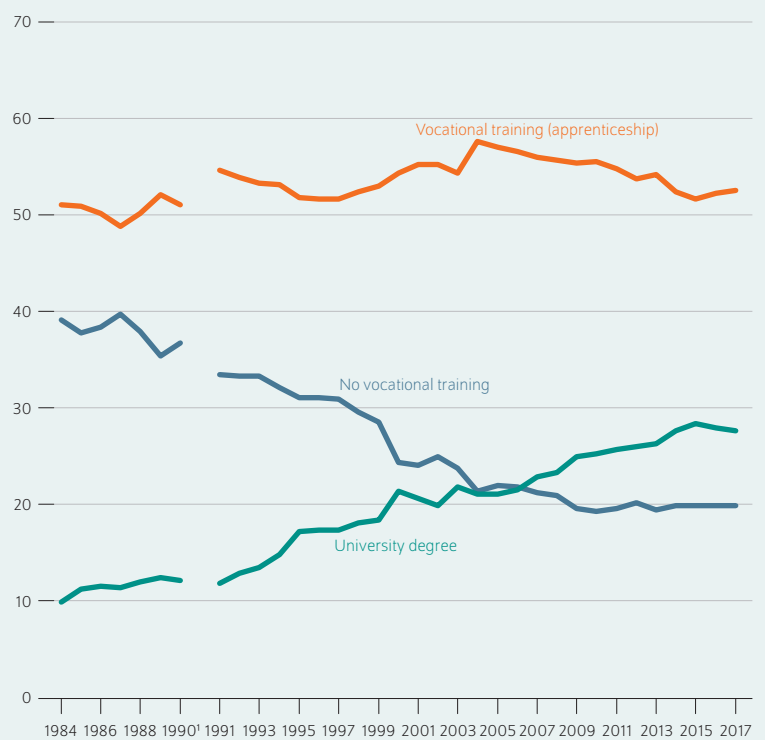
The simulation for the “old” Federal Republic of Germany shows that in this case, value added and thus productivity between 1970 and 1991 would have increased to a lesser extent than they did in reality (Figure 3), leading to the conclusion that sectoral change was driving productivity at the time. One of the reasons for this is that agriculture experienced a significant loss in importance in the decades preceding German reunification.

The development described above continued for some time after the fall of the Berlin Wall, in terms of per capita productivity until 1998 and in terms of hourly productivity until 2002. Then the development reversed, with slowdowns in productivity growth accompanying sectoral shifts. Therefore, the sectoral change slowed productivity growth in the past and current decades. This is particularly clear in the case of a strongly disaggregated sectoral structure.

However, the dampening effect due to the sectoral change was not large. As the model presented shows, the increase

Figure 2

**Jobs with various qualification requirements and their share in the total working time of the workforce**  
Share of the total hours worked per week in percent



1 Pre-unification German federal states until 1990, unified Germany starting in 1991

Source: SOEP v34; author's own calculations.

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The share of jobs requiring a university degree has increased by almost 20 percentage points since 1984.

in overall productivity growth would have slowed down even without structural changes (Figure 4).<sup>12</sup> Over the past decade, sectoral change slowed growth of real GDP per hour worked by only 0.2 percentage points per year, compared with an annual average of 0.1 percentage points in the first eight years of this decade. It also shows that productivity growth has slowed in two-thirds of sectors, a vast majority. Some sectors have even declined in productivity.

**Is bureaucracy impeding productivity growth?**

Thus, there must be other factors slowing productivity growth. One explanation for weak productivity growth could be the low wage increases in the past. But if the labor is cheap, there is no incentive to rationalize and modernize capital

<sup>12</sup> Similar findings have been made for France by its productivity council. Cf. Agnès Bénassy-Quéré et al., *Productivity and competitiveness in the euro area: A view from France* (VOX CEPR Policy Portal, 2019) (available online).

## PRODUCTIVITY GROWTH

Table 4

### Sectoral structure of gross value added and hourly productivity growth in economic sectors

In percent

	Share of overall volume of work				Hourly productivity in euros in 2000	Average annual change of real gross value added per hour worked			
	2000	2010	2016	2018		1991 to 2000	2000 to 2010	2010 to 2016	2010 to 2018
Agriculture and forestry, fisheries	2.6	2.0	1.7	1.6	13.56	0.6	2.3	0.3	0.7
Mining and quarrying	0.3	0.2	0.1		27.46	2.7	2.3	1.7	
Manufacturing	20.1	18.0	18.4	18.4	37.63	3.2	2.5	2.0	1.6
Food products, beverages, tobacco products	2.3	2.3	2.2		26.94	-0.1	-1.1	6.0	
Textiles, apparel, leather goods, shoes	0.7	0.4	0.4		23.77	4.6	2.9	-0.1	
Wood products, paper, printing	1.5	1.2	1.1		32.56	3.1	2.2	1.6	
Coke and refined petroleum products	0.1	0.0	0.0		156.61	-11.7	-2.7	3.5	
Chemicals and chemical products	1.0	0.8	0.9		59.31	6.3	3.1	-0.7	
Basic pharma. products, pharma. preparations	0.3	0.3	0.3		74.44	6.4	4.7	-0.4	
Rubber, plastic, glass products, ceramics etc.	1.9	1.7	1.7		32.92	3.2	2.3	1.1	
Basic metals, fabricated metal products	3.0	2.8	2.8		32.11	3.3	0.6	1.6	
Computer, electronic, optical products	0.9	0.8	0.9		59.86	8.4	9.7	4.6	
Electrical equipment	1.4	1.2	1.2		43.95	3.2	1.1	-0.5	
Machinery and equipment	2.7	2.6	2.8		38.71	2.8	0.3	-0.7	
Transport equipment	2.6	2.2	2.4		43.22	0.2	5.1	3.7	
Furniture; rep. and install. of machinery and equipment	1.7	1.6	1.6		27.41	3.2	1.6	-0.1	
Electricity, gas, steam, and AC supply	0.7	0.7	0.6		73.57	6.8	2.8	-1.3	
Water supply, waste management, etc.	0.7	0.7	0.7		47.65	-4.3	0.6	3.9	
Building	8.2	6.8	6.6	6.6	20.58	-0.2	0.0	0.7	0.9
Trade; vehicle maintenance and repair	14.9	14.0	13.3	13.1	22.55	1.2	2.3	2.4	2.3
Transportation and storage	5.0	5.0	5.2	5.3	27.70	4.1	2.8	-0.7	-0.5
Hospitality	3.9	4.0	3.9	3.8	13.57	-1.9	-1.8	1.6	1.9
Information and communication	2.7	3.0	3.1	3.2	55.36	6.2	3.0	3.5	2.6
Publishing activities, audiovisual media and radio	0.8	0.8	0.7		56.28	3.6	0.3	1.0	
Telecommunications	0.6	0.4	0.3		88.75	14.1	8.8	5.2	
IT and information service providers	1.3	1.9	2.1		39.38	2.5	3.1	5.5	
Financial and insurance services	3.5	3.2	3.0	2.8	41.35	1.0	-1.8	1.3	1.6
Real estate activities	1.0	1.0	0.9	0.9	350.93	0.8	2.5	1.3	0.8
Business service providers	9.2	12.4	13.2	13.3	38.21	-1.0	-2.0	-0.3	-0.2
Professional and technical service providers	3.6	4.8	5.1		43.47	-0.7	-2.4	-2.1	
Research and development	0.4	0.4	0.5		60.80	0.7	0.1	-0.3	
Other professional, scientific, technical service providers	0.8	1.0	1.0		50.86	-5.0	-4.6	2.4	
Other business service providers	4.5	6.1	6.5		29.82	-0.6	-1.1	0.6	
Public administration and defense; compulsory social security	7.3	6.7	6.1		29.46	2.6	1.5	1.6	
Education	4.5	5.2	5.3		31.39	0.1	-1.5	-0.6	
Human health and social work activities	9.8	11.4	12.5		20.89	1.9	1.2	-0.1	
Human health activities	6.0	6.7	7.3		25.66	1.4	1.4	0.0	
Residential care and social work activities	3.8	4.7	5.3		13.47	3.2	0.8	0.2	
Arts, entertainment, and recreation activities	1.3	1.5	1.5		32.61	-1.2	-1.2	1.6	
Other service activities NES	3.3	3.4	3.1		26.26	0.9	-0.1	-0.2	
Personal domestic services	0.8	0.8	0.7		12.12	0.9	0.5	0.3	
All economic sectors	100	100	100		32.94	2.1	1.2	1.0	0.9

Source: Federal Statistical Office; author's own calculations.

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Box 1

**Shift-share analysis: approach and data**

In the shift-share analysis, it was assumed that the distribution of work among sectors of the economy, measured in terms of the number of gainful workers and the number of hours worked, remained unchanged over time, but that per capita and hourly productivity within the individual sectors changed. In the simulation, these develop as the official statistics show. The same applies to the total number of gainful workers and the volume of work in the economy as a whole. By comparing the results with actual developments, the effect of sectoral change can be determined.

Employment data from the national account systems were used. However, the data situation differs with regard to sectoral differentiation. Generally, there is sectoral information about both the number of gainful workers as well as the work volume, e.g. the number of hours worked by the workforce. For 1970 to 1991, the volume of work, and thus hourly productivity, can only be broken down into six economic sectors, but disaggregation into 52 sectors is possible with regard to the number of gainful workers and thus per capita productivity.

Very deeply structured data always has a time delay. Currently, the data is available for 1991 to 2016. Information on per capita

productivity is available for 63 economic sectors and information on hourly productivity is available for 37 economic sectors. For the years 2017 and 2018 the structure is rougher: There is information on 13 economic sectors for both the number of gainful workers and their work volume.

Two base years were selected. The year 1970 was used to take the time before German reunification into consideration. For the period thereafter, sectoral distribution of the share of gainful workers or the volume of work has remained constant since 1991.

In the first step of the analysis, gross value added and thus productivity at current prices were simulated with a constant distribution of gainful workers and work volume. Subsequently, an adjustment for price changes was made. It also had to be taken into account that the results for the individual sectors cannot easily be added to an overall result.<sup>1</sup> Thankfully, the Federal Statistical Office has provided absolute values for the chain-linked volume of gross value added.

<sup>1</sup> Wolfgang Nierhaus, "Preisbereinigtes Bruttoinlandsprodukt: Zur Veröffentlichungspraxis im Gemeinschaftsgutachten," *IFO-Schnelldienst* 9 (2008): 15–18 (in German).

stock.<sup>13</sup> This could also explain why investment activity in Germany has been weak in the recent past.<sup>14</sup> The situation is similar in regards to monetary policy. When central banks keep key interest rates very low for a long time, competitive pressure among businesses is reduced. As a result, less efficient businesses could continue to exist when they should actually withdraw from the market. Wage policy and monetary policy can therefore be sluggish and negatively affect productivity growth. The same applies to subsidies: If companies are accustomed to subsidies from politicians, a subsidy mentality can spread, which has an inhibiting effect on companies' willingness to innovate.

A further factor could be increasing bureaucratization (Box 2). Authors from various fields and theoretical positions have pointed to increasing amounts of state regulation. Regulations are necessary in order to ensure fair competition, but excessive regulation can lead to a waste of resources. One example is public procurement. In Berlin, increasingly more companies are refusing to bid for public contracts due to the large number of requirements they must meet.<sup>15</sup> This is because the state is not only concerned with the provision

<sup>13</sup> However, it can be determined that productivity growth has also slowed significantly in France—where there have by no means been as few wage agreements as in Germany in the past. Cf. Karl Brenke, "Industrielle Entwicklung. Deutschland und Frankreich driften auseinander," *DIW Wochenbericht* no. 48 (2012): 3–14 (in German; available online).

<sup>14</sup> Cf. Marcel Fratzscher, *Die Deutschland-Illusion: Warum wir unsere Wirtschaft überschätzen und Europa brauchen* (München, 2014).

<sup>15</sup> Cf. Dominik Bath, "Wirtschaft fordert Änderungen am Vergabegesetz," *Berliner Morgenpost*, June 5, 2019 (in German; available online).

Table 5

**Structure of the workforce according to the focus of their professional activity**  
In percent

	Total economy			Manufacturing sector		
	1996	2004	2015	1996	2004	2015
Machinery, facilities, configuring devices	8.1	7.9	7.1	22.6	23.8	23.1
Cultivation, breeding, tending plants	2.6	2.0	1.7	0.3	0.2	0.2
Mining, extracting, extracting raw materials	0.3	0.2	0.2	0.3	0.2	0.1
Manufacturing, processing, building/developing, installation	13.3	10.1	9.3	25.6	22.6	20.2
Purchasing/selling, brokering	10.6	10.6	10.1	6.4	6.7	8.0
Repair, renovation, maintenance	4.4	3.9	3.6	4.2	3.5	3.3
Clerical work, computing work, data processing	14.5	14.4	12.2	12.4	12.3	10.6
Metering, examining, testing, inspecting according to specified procedures	2.5	2.5	2.9	4.5	4.8	5.8
Research and development, product conception and design	3.7	4.2	5.2	6.2	7.1	9.4
Advertising, marketing, public relations activities	1.3	1.6	1.6	1.5	1.6	1.3
Management, management and leadership activities	3.8	3.9	5.6	4.5	4.9	7.0
Catering, hosting, meal preparation	3.7	3.9	4.1	1.3	1.3	1.4
Application of laws, regulations, ordinances	2.5	2.6	3.0	0.1	0.2	0.4
Education, teaching	5.2	5.6	6.1	0.4	0.2	0.3
Consulting, informing	2.7	3.9	3.9	0.8	1.2	1.2
Health/social work activities, nursing	7.9	9.1	10.6	0.5	0.5	0.6
Artistic, journalistic, entertainment activities	0.8	1.0	1.1	0.5	0.7	0.4
Driving vehicles, packing, loading	6.3	6.4	6.1	6.5	6.7	5.6
Cleaning, waste disposal, recycling	3.3	4.0	3.9	1.1	1.2	1.0
Security, protection, guarding	2.5	2.3	1.7	0.3	0.3	0.2
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: Microcensus; Federal Statistical Office; author's own calculations.



Box 2

Comments on the bureaucratization debate

Around 100 years ago, the term "bureaucracy" did not have a solely negative connotation. In Max Weber's "Economy and Society," (*Wirtschaft und Gesellschaft*), he refers to bureaucracy as the "most rational known means of exercising authority over human beings."<sup>1</sup> This applies both to the public authorities and to the private sector, especially capitalist enterprises.<sup>2</sup> Due to its "formalistic impersonality," official duties, clear-set rules, and above all, the expertise of its workers, almost everyone is hopelessly inferior to bureaucracy. Only capitalist entrepreneurs can keep up because of their technical and economic knowledge.<sup>3</sup> Due to the "superiority of the professional insider,"<sup>4</sup> bureaucracy is a virtually indestructible social structure.<sup>5</sup> According to the trend, bureaucracy would become a "growing indispensability," consequently, there would be "an irresistible advance of bureaucratization."<sup>6</sup>

In 1917, "The State and Revolution" by Vladimir Lenin was published, in which he discusses the shaping of communism. Lenin was so enthusiastic about the Prussian Post that, as a first step, "the entire economy" had to be "organized according to the model of the Post."<sup>7</sup> In fact, strong bureaucracy characterized socialism according to the Soviet model until its downfall.

The positive view of bureaucracy at the time stemmed from admiration of the efficiency of state administration, especially the development of modern methods of communication such as the postal service. There was also a growing interest in effective operational processes in businesses, especially in the emerging large companies in Europe and the USA. Increasingly, there was a scientific foundation to management.

Unlike in sociology or politics, the common layman perception of terms such as bureaucracy, especially "bureaucrat," always have a negative connotation. Shortly before the end of World War II, there was no positive connotation to bureaucracy whatsoever. The liberal economist Ludwig von Mises stated that all over the world these terms were only used with a scurrilous undertone. Public opinion considers bureaucracy evil, especially in the United States, because it has become independent, taken power, and acts arbitrarily, i.e., without democratic control.<sup>8</sup> In the public perception, bureaucratic apparatuses were located only in the state. Von Mises shared this opinion: in private companies, bureaucracy can develop without a negative connotation, as those responsible for wrong decisions or mismanagement are kept accountable—all incentives

are geared towards effectiveness.<sup>9</sup> State bureaucracy can still negatively affect private companies, such as through revenue cap regulations or affecting staffing.<sup>10</sup> Weber also noticed problems of this nature.<sup>11</sup>

Why does Weber attribute enormous power to the bureaucracies but assume that the people belonging to them would not use this power in their own interests and would always act dutifully and altruistically? Weber would also certainly be surprised at the extent to which the allegedly omnipotent state bureaucrats now refer to private consultants. In contrast, von Mises sees that bureaucracies can develop a life of their own that can run counter to their actual purpose. However, he views bureaucratic problems as solely a state matter, as his line of thinking (the Austrian School of Economics), regards private companies as the haven of efficiency. In fact, employees in private companies can also develop and pursue their own interests.<sup>12</sup> Especially in large companies, decisions are often made by employees who are formally dependent on, but in fact not subject to, the owners.

David Graeber, an anthropologist, has pointed to "bullshit jobs," jobs which are comprised entirely of useless activities. Such jobs could be those that give superiors more prestige but are completely superfluous for the company.<sup>13</sup> The jobs are particularly common among members of the middle class, especially office jobs.<sup>14</sup>

A job can be comprised entirely of useless activities or those activities can occur in addition to quite meaningful ones. Regular surveys of workers with knowledge-intensive jobs (IT and qualified administrative staff), for example in the USA, show that a large proportion of total work time is devoted to tasks that have little to do with the actual workforce's actual tasks. More recently, one-sixth of work time was spent on email and almost 20 percent on meetings, half of which were considered useless. Eleven percent of work time was spent on administrative tasks, nine percent on unwanted interruptions, and four percent on other distractions; overall, only 44 percent of work time was spent on actual tasks.<sup>15</sup>

1 Max Weber, *Wirtschaft und Gesellschaft* (Tübingen, 1972), 128 (in German).

2 Weber, *Wirtschaft und Gesellschaft*, 550.

3 Weber, *Wirtschaft und Gesellschaft*, 129.

4 Weber, *Wirtschaft und Gesellschaft*, 572.

5 Weber, *Wirtschaft und Gesellschaft*, 569.

6 Weber, *Wirtschaft und Gesellschaft*, 836.

7 Vladimir I. Lenin, "The State and Revolution," in *W.I. Lenin: Ausgewählte Werke* vol. 2 (Berlin: 1970), 358f (in German).

8 Ludwig von Mises, *Die Bürokratie* (Sankt Augustin, 2013), 19ff (in German).

9 von Mises, *Die Bürokratie*, 48ff.

10 von Mises, *Die Bürokratie*, 76ff.

11 He speaks of a "state-socialist effect that strangulates opportunities for private profit." Cf. Weber, *Wirtschaft und Gesellschaft*, 571.

12 Robert K. Merton, *Social Theory and Social Structure* (New York: 1968), 249ff.

13 Cf. David Graeber, *Bullshit-Jobs. Vom wahren Sinn der Arbeit* (Stuttgart: 2018) (in German).

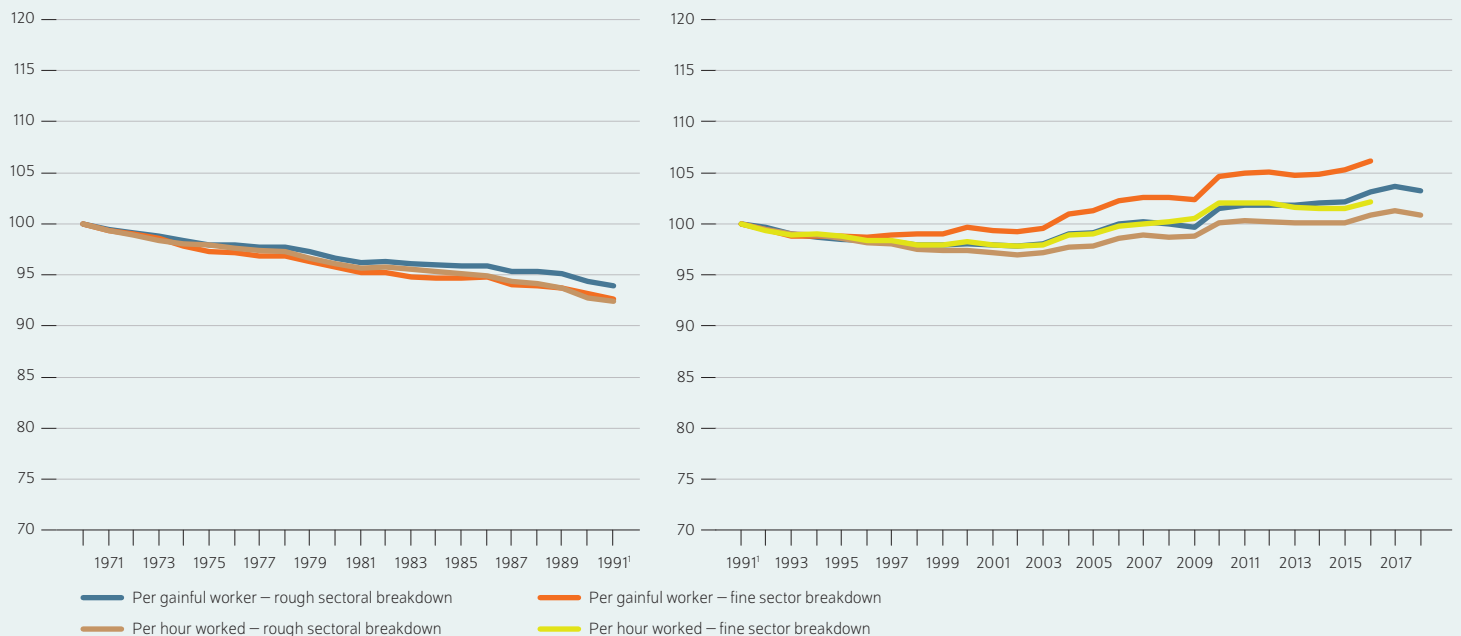
14 Graeber, *Bullshit-Jobs*.

15 Workfront, *The State of the Enterprise Work Report 2017-18*.

Figure 3

**Productivity growth under an assumed unchanged sector structure**

Deviation from real growth. Index = 100 based on base years 1970 and 1991



1 Pre-unification German federal states until 1991, unified Germany starting in 1992

Source: Federal Statistical Office; author's own calculations.

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Sectoral change drove productivity growth between 1970 and 1991. Beginning at the turn of the millennium, the shift towards services slowed productivity growth.

of services but also with collective bargaining, social, educational, and ecological objectives as well as gender equality.

However, there is also the bureaucracy that arises in the organizations (companies, agencies) themselves. Additional functions can help companies find new customers and enter new markets, driving productivity. However, for-profit companies may spend their resources to a significant and increasing extent on purposes that have little or nothing to do with the actual business purpose. This raises costs although yields do not increase to the same extent, or at all.

Bureaucratization is difficult to analyze empirically. There is no information available about how much time gainful workers spend on different tasks in Germany, only data on full employment. At this level, it can be determined whether the employment structure has become “bureaucratized”—if it has shifted to jobs that are vital to bureaucracy. Such jobs include, in particular, all administrative duties as well as management functions when they are a part of the administrative area.

Within the framework of the Microcensus, a survey based on a very large sample (about 600,000 people), the “predominantly exercised activity” is surveyed according to a rough classification with longer intervals between the survey waves.

The most recent data is available for 2015.<sup>16</sup> The years 2004 and 1996 were used for comparison.

There has been a significant shift in the employment structure, which partly reflects the sectoral change (Table 3). In particular, jobs that are regarded as bureaucratic activities have become more important, such as management and leadership activities and activities related to the application of laws and regulations. This change cannot be explained by the sectoral shift because it was present within individual economic sectors as well as the manufacturing industry.

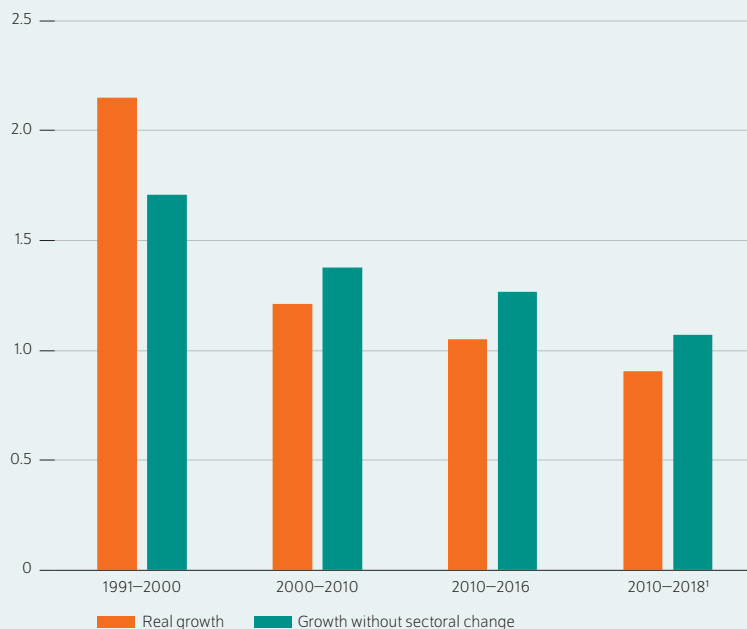
However, one job category that is also a part of the bureaucratic professions has actually lost relevance: clerical work, computing work, and data processing. Because this category is comprised of a wide range of activities, the focus was on the professions. Sample census data from 1996, 2006, and 2016 were available for the corresponding analysis.<sup>17</sup> According to the data, jobs in IT have clearly gained in importance

<sup>16</sup> Because the data were not available at DIW Berlin, they were made available by the Federal Statistical Office as part of a special evaluation. Special thanks to Ms. Mann from the Federal Statistical Office's Labor Market department for her help.

<sup>17</sup> For the purpose of the analysis, the professions were divided into groups. For 1996 and 2006, the German Classification of Occupations from 1992 was available; for 2016, the classifications were according to ISCO 08 (International Standard Classification of Occupations). Since different classifications were used, only rough summaries of the professions were possible.

Figure 4

**Growth of real gross value added per hour worked**  
Average annual change in percent



1 Rough breakdown of economic sectors

Source: Federal Statistical Office; author's own calculations.

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The impact of sectoral change on productivity has been minimal recently.

(Table 6). Office jobs requiring medium-level qualifications have stagnated proportionately while simple office jobs (such as clerical work) have decreased in comparison. Looking at occupations, there is also an overproportional increase in management positions. The number of individuals in a profession that can be classified as highly qualified bureaucratic jobs has also increased.

**Conclusion: influence of bureaucratization requires further investigation**

Changes in the workforce’s qualifications cannot explain the increasing slowdown in productivity growth. On the contrary, the share of the work volume accounted for by academics has steadily increased, and the importance of low-skilled jobs declined until 2010, when it began to stagnate. The situation is different with sectoral change. The trend towards services has had a small dampening effect on productivity growth. Therefore, there must be other inhibiting factors, such as monetary policy or past wage policies. It is possible that Kondratiev’s “long waves” are also noticeable.<sup>18</sup> If this were the case, technological progress would have been in a cooling-off phase for some time now and there would be a waiting period for new, revolutionary inventions that would boost productivity again.

Another way to explain the decrease in productivity growth is increasing bureaucracy. In fact, bureaucratic jobs have become more important. However, that is not proof that this development has slowed productivity growth. There is still a lack of knowledge about the correlation between bureaucratization and productivity, especially within organizations such as companies. The data available on Germany for such studies is poor. For example, it would be important to have information on how work hours are spent, broken down according to different tasks, and how it has changed over time.

Table 6

**Volume of work of workforce in select occupational groups**  
Percentage share of total workforce (measured in terms of hours worked per week)

	Total economy			Manufacturing sector		
	1996	2006	2016	1996	2006	2016
Low and medium skilled administrative jobs	20.3	20.0	20.5	14.1	13.1	15.1
Highly skilled administrative jobs	0.8	1.4	3.5	0.6	1.2	3.1
Management jobs	4.1	4.1	5.7	4.3	4.5	5.9
IT jobs	1.2	2.3	2.4	1.5	1.8	2.1

Source: Microcensus; author's own calculations.

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<sup>18</sup> Kondratiev (Konradtjew in German) described economic progress as a process that takes place in “long waves.” Cf. Nikolai D. Kondratjew, “Die langen Wellen der Konjunktur,” in *Archiv für Sozialwissenschaft und Sozialpolitik* vol. 56 (1926), 573–609 (in German).

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