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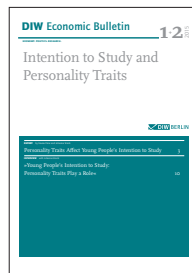
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## NEXT ISSUE OF DIW ECONOMIC BULLETIN

# DIW economic outlook

# Increased labor market participation can't do the job of mastering Germany's demographic change in the future

By Karl Brenke and Marius Clemens

In the last decade the available labor force has expanded in Germany—despite the decline in the working-age population. The reason: labor market participation has increased, for women in particular and older people in general. Also noticeable was a rise in qualification level because well-educated people have a particularly high propensity to participate in the labor market. Most recently, Germany's potential labor force has grown as a consequence of many factors, including migration—from other EU member states in particular. The immigrants from EU countries now exhibits higher labor market participation than that of Germans. This is due to the favorable age structure of the migrants from the EU. The situation is different overall for migrants from non-member states: their participation is relatively low. This may have to do with lack of access to the job market. However, another factor is that the participation of women from non-member states is far below the average. In the future, Germany will be more or less reliant on migration. This is the finding of various model calculations showing the effects of demographic influences and participation behavior on Germany's future labor supply. Even if Germany's level of labor market participation rises to Switzerland's current level by 2040, the finding still applies. The Swiss example shows that policy makers were successful at attracting persons with higher labor market participation from abroad. In Switzerland, the labor market participation of older people is also much higher than in Germany. Policy makers in Germany should take that into account and ensure that skill potential is not prematurely lost to early retirement. Granting tax and social contribution privileges to the semiretired is counterproductive.

Since the turn of the millennium, Germany's demographic change has been a much-discussed phenomenon. Life expectancy is increasing and the younger cohorts are getting smaller because the birth rate is too low, a combination that is forcing the age structure to shift upward. This trend raises the question of whether or not a sufficiently economically active population will be available to the German job market in the long term.

The present report analyzes the most recent development in the work force available to the market—the potential labor force—and in the process, explores the factors that influence the development. The economically active population includes people who are in employment (the employed) and those who are searching for a job, the unemployed.<sup>1</sup> Building upon the analysis, we will present scenarios of future development involving the most influential factors.

As with other comparable analyses,<sup>2</sup> this study can only be based on official statistics. However, the fact that the official statistics exhibit significant deficiencies at present is an aggravating factor. The main problem is that the 2011 census showed that the number of German residents was previously overestimated, and the population data before 2011 has still not been adjusted accordingly. This is why the available data on labor market participation before and after the 2011 census are not compatible.

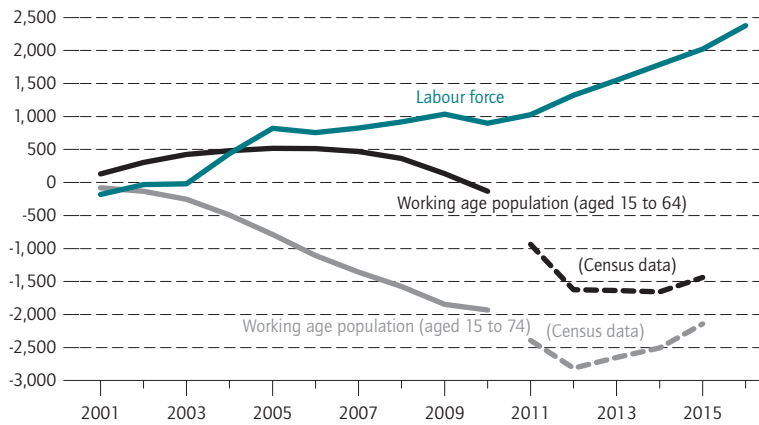
<sup>1</sup> The unemployed are those persons who have no paid job, are available to the job market on short notice, and are actively seeking employment.

<sup>2</sup> Johann Fuchs, Doris Söhnlein, and Brigitte Weber, "Rückgang und Alterung sind nicht mehr aufzuhalten. Projektion des Arbeitskräftepotenzials bis 2050," *IAB Kurzbericht* no. 16/2011 (2011). (available online, Accessed August 10, 2017); Robert Helmrich et al., "Engpässe auf dem Arbeitsmarkt: Geändertes Bildungs- und Erwerbsverhalten mildert Fachkräftemangel," *BIBB Report* no. 18/2012 (2012). (available online, Accessed August 10, 2017)

Figure 1

**Working age population and labor force**

Absolute change compared to year 2000, in thousand persons



Sources: Federal Statistical Office (population update and national accounts); authors' own calculations.

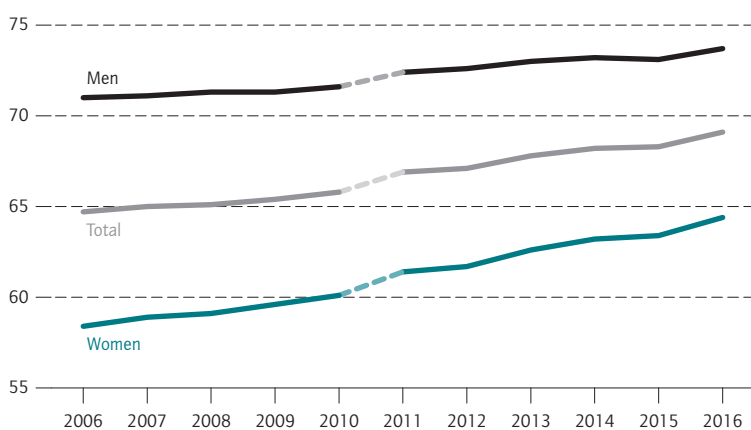
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Labor force grows despite declining working-age population.

Figure 2

**Participation rates by gender**

Labor force as a percentage of the working age population (15 to 74)



Source: Eurostat (Labor Force Survey).

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Labor force participation of women is rising much faster than that of men.

**Labor force grows despite declining number of population**

In Germany, the population between ages 15 and 64 (the long-standing legal retirement age<sup>3</sup>) is typically considered “able to work”. The International Labor Organization (ILO) uses a wider range of working-age people: age 15 to 74. According to the official projection, the size of the population between 15 and 64 has steadily declined in the past decade. It fell by 1.9 million between 2000 and 2010 (see Figure 1). As a result of the census results the number was corrected downward, and it also decreased the following year. As of 2013, the size of the population between 15 and 64 increased—due to migration. The working-age population based on the ILO definition experienced a similar trend except for one deviation. It increased until 2004 but declined thereafter and in 2010 was below the level it had in 2000. Regardless of the range selected and despite any statistical uncertainty, the size of Germany’s working-age population clearly decreased between 2000 and 2012. There was a subsequent rise, but it was by no means able to compensate for the previous loss.

The population decline in itself should have resulted in a shrinking potential labor force. But the opposite held true. The national accounts indicated steady growth in the number of employed persons that was only briefly interrupted in 2006 and 2010. At times population growth and labor force growth drifted apart, and the two trends have only developed in parallel recently—both are experiencing an upswing.

We can deduce that the size of the available labor force does not depend on population growth only. Participation behavior is another influencing factor. After all, an increasing proportion of the working-age population is participating in the labor market. The participation rate—the number of economically active persons per 100 residents—has steadily increased. Among 15- to 74-year-olds, it rose from 66.9 percent in 2011 to 69.1 percent in 2016 (see Figure 2). For women in particular, the growth rate surged. Their participation rate is still lower than that of men, but despite starting at a lower level they have significantly reduced the gap.

**Labor market participation increasing in other countries**

Increasing labor market participation is not solely a German phenomenon; it is in fact prevalent in most Euro-

<sup>3</sup> However, at the beginning of 2008 a pension reform went into effect that gradually raises the legal retirement age as of the 1947 birth cohort. Currently, the legal retirement age is 65.5 for the 1952 birth cohort.

Table 1

**Participation rates in Europe**

Labor force as a percentage of the working age population (15 to 74)

	Total		Men		Women	
	2006	2016	2006	2016	2006	2016
Iceland	82.5	83.8	86.9	87.7	77.8	79.7
Switzerland	73.9	75.6	81.0	80.6	66.9	70.6
Sweden	70.9	72.1	73.8	74.4	67.9	69.7
Estonia	66.1	70.7	71.1	75.8	61.5	66.1
Norway	71.9	70.5	75.4	73.3	68.3	67.6
Denmark	72.4	70.1	76.5	73.5	68.4	66.6
Netherlands	70.2	70.0	76.9	74.9	63.5	65.1
United Kingdom	68.6	69.2	75.1	74.4	62.2	64.1
<b>Germany</b>	<b>64.7</b>	<b>69.1</b>	<b>71.0</b>	<b>73.7</b>	<b>58.4</b>	<b>64.4</b>
Latvia	64.2	68.2	70.8	72.2	58.4	64.6
Austria	64.6	67.7	71.1	72.4	58.3	63.0
Lithuania	60.0	67.6	64.6	70.9	56.0	64.6
Cyprus	67.3	66.3	77.1	71.5	58.1	61.6
Finland	67.2	65.6	69.8	68.1	64.6	63.1
Portugal	67.3	65.5	73.5	69.9	61.4	61.6
Spain	63.6	65.4	73.5	70.5	53.6	60.3
Czech Republic	63.7	65.3	72.2	73.1	55.5	57.6
Ireland	67.0	64.6	76.7	71.5	57.2	57.8
<b>EU</b>	<b>62.5</b>	<b>64.4</b>	<b>69.9</b>	<b>70.2</b>	<b>55.2</b>	<b>58.7</b>
Slovakia	62.8	64.4	71.1	71.4	54.9	57.6
Luxembourg	59.1	63.7	65.6	68.5	52.4	58.8
Slovenia	63.8	62.8	68.8	66.2	58.7	59.3
France	62.1	62.3	67.4	66.3	57.0	58.6
Poland	57.7	61.3	65.0	69.0	50.8	54.0
Hungary	55.0	61.1	62.5	68.6	48.2	54.1
Greece	58.6	59.6	69.9	67.2	47.6	52.3
Malta	52.2	59.6	71.7	71.6	32.7	47.2
Belgium	58.9	59.4	65.7	64.1	52.1	54.7
Romania	58.9	59.3	66.1	68.5	52.0	50.2
Bulgaria	56.2	59.2	61.1	64.3	51.6	54.2
Macedonia	56.7	58.3	68.9	71.1	44.4	45.3
Croatia	53.9	57.4	60.2	62.6	48.0	52.3
Italy	54.8	56.6	66.1	66.0	43.7	47.5
Turkey	46.8	54.2	70.5	74.4	23.9	34.1

Source: Eurostat (Labor Force Survey).

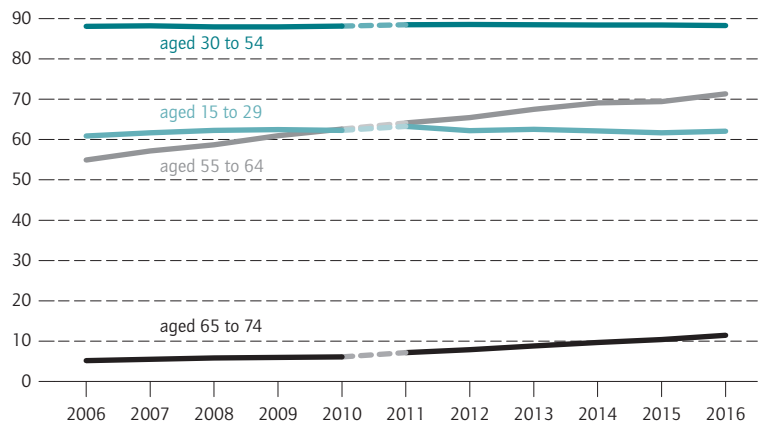
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pean countries. Again, starting at a low level, the labor force participation rate of women is rising much faster in Europe than that of men (see Table 1). But Germany is experiencing an above-average increase in participation: it is among the top countries in Europe. The figure is only higher in some northern European countries, Switzerland, and the Netherlands.

Figure 3

**Participation rates by age groups**

Labor force as percentage of the working age population (15 to 74) in a specific age group



Sources: Eurostat (Labor Force Survey); authors' own calculations.

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Especially older people increase their labor market activity.

**Women and older people are flocking to the job market**

The extent of labor market participation varies considerably with regard to age. The participation rate is particularly high among people age 30 to 54. It is much lower for older people, teens, and young adults. For persons under 29, growth in participation has been slightly negative since 2011 (see Figure 3). In all likelihood, this reflects the fact that a growing portion of this age group is enrolling in institutions of higher education.<sup>4</sup> However, the participation rate of women in that age group has fallen to a lesser extent than that of men (Table 2). From the mid-20s through age 40 to 44, the participation rate among women plateaued, but that of men declined in the same period. Between ages 45 and 49, the labor market participation of men fell while that of women rose. And the participation rate of 55- to 64-year-olds has sharply risen. In the 65+ age group, the participation rate has surged—despite starting at a low level. The rise among women in that age group was considerably sharper than that of men.

<sup>4</sup> For example, the proportion of first-year students in an age cohort in 2014 (freshman rate) was just below 60 percent in 2014 – 21 percentage points higher than ten years before. See German Federal Statistical Office, "Hochschulen auf einen Blick," (PDF, German Federal Statistical Office, Wiesbaden, 2016). (available online, Accessed August 10, 2017)

Table 2

**Participation rates by gender, nationality, and age groups**

Labor force as a percentage of the working age population (15 to 74) in a specific age group

	Total		Natives		Foreigners from EU		Foreigners (except EU)	
	2011	2016	2011	2016	2011	2016	2011	2016
	<b>Total</b>							
15-19	30.4	29.0	30.9	29.5	27.7	31.1	24.0	20.9
20-24	70.9	68.1	71.5	70.2	69.0	71.7	61.7	47.1
25-29	83.2	82.5	85.0	85.5	81.1	84.0	62.7	56.9
30-34	87.0	86.2	89.1	89.4	84.8	84.5	68.3	61.5
35-39	88.0	87.4	89.9	90.3	85.7	85.5	72.6	65.8
40-44	90.3	89.3	91.3	91.6	87.2	88.5	76.0	71.3
45-49	89.6	90.3	90.5	91.7	87.9	88.6	74.5	71.4
50-54	86.6	87.8	87.3	89.0	83.2	85.7	69.9	66.6
55-59	79.0	82.3	79.8	83.3	77.5	80.4	56.3	58.0
60-64	47.4	58.6	48.2	59.1	45.0	61.6	31.1	42.0
65-69	10.2	15.6	10.2	15.7	12.6	17.8	5.7	9.9
70-74	4.6	6.6	4.6	6.6	6.4	10.0	3.4	3.9
75 and older	1.4	1.9	1.4	1.9	.	.	.	.
<b>15-64</b>	77.3	77.9	78.2	79.4	76.6	80.1	62.8	58.5
<b>15-74</b>	75.6	76.5	76.3	77.7	75.7	78.7	63.7	59.2
<b>20-69</b>	66.9	69.1	67.2	69.8	71.1	74.5	58.9	55.1
<i>Labor force in 1,000*</i>	41,088	42,881	37,607	38,052	1,601	2,523	1,881	2,307
	<b>Men</b>							
15-19	32.7	31.1	33.3	32.0	29.3	31.8	25.3	20.7
20-24	73.6	69.6	73.7	71.5	74.6	78.5	71.0	49.6
25-29	87.2	85.6	87.5	87.6	91.2	92.9	80.0	66.0
30-34	94.4	92.7	94.8	94.6	95.8	95.1	90.3	75.5
35-39	95.5	94.0	95.9	95.4	96.1	96.2	91.9	81.0
40-44	95.5	93.7	95.9	94.9	95.1	94.2	90.1	83.5
45-49	94.3	93.8	94.6	94.5	95.6	93.7	88.2	82.9
50-54	91.5	91.9	91.8	92.6	91.8	91.8	83.7	78.8
55-59	85.6	87.4	85.9	88.0	86.7	87.6	73.2	71.0
60-64	56.2	64.6	57.1	64.7	50.6	69.1	39.6	52.7
65-69	13.0	19.5	13.2	19.6	12.8	21.1	7.2	14.4
70-74	6.5	9.3	6.5	9.4	7.0	12.1	4.3	4.4
75 and older	2.3	3.1	2.2	3.1	.	.	.	.
<b>15-64</b>	82.7	82.2	82.9	83.0	84.3	87.6	77.3	68.1
<b>15-74</b>	81.3	81.3	81.4	81.8	83.0	86.2	78.7	70.1
<b>20-69</b>	72.4	73.7	72.3	73.9	77.1	81.4	72.0	64.5
<i>Labor force in 1,000*</i>	22,074	22,984	20,066	20,086	889	1,496	1,119	1,402
	<b>Women</b>							
15-19	28.0	26.6	28.5	26.9	25.8	30.3	22.6	21.3
20-24	68.2	66.5	69.3	68.9	63.3	64.1	52.8	43.7
25-29	79.2	79.1	82.5	83.3	71.5	73.8	47.8	45.1
30-34	79.5	79.4	83.4	84.0	74.7	72.2	48.1	47.3
35-39	80.6	80.6	83.9	85.1	76.7	73.1	55.2	51.5
40-44	84.9	84.8	86.6	88.2	79.2	81.6	61.6	58.9
45-49	84.9	86.7	86.3	88.9	78.9	82.3	60.1	59.4
50-54	81.8	83.7	83.0	85.4	74.6	78.1	57.7	53.5
55-59	72.6	77.3	73.9	78.7	68.1	71.6	44.1	45.3
60-64	38.9	52.9	39.6	53.7	38.1	52.5	23.4	33.7
65-69	7.5	12.0	7.5	12.2	12.3	13.9	3.9	6.2
70-74	3.1	4.3	3.1	4.3	5.2	7.6	1.9	2.7
75 and older	0.8	1.0	0.8	1.0	.	.	.	.
<b>15-64</b>	71.9	73.6	73.5	75.8	68.8	71.3	49.2	48.0
<b>15-74</b>	69.9	71.7	71.2	73.7	68.2	69.9	49.7	47.8
<b>20-69</b>	61.4	64.4	62.2	65.8	64.7	66.3	46.5	44.9
<i>Labor force in 1,000*</i>	19,014	19,898	17,541	17,966	712	1,027	761	905

\* 15-74 years

Source: Eurostat (Labour Force Survey); Calculations of DIW Berlin.

Persons 75+ are the exception. Among them men's participation in the labor market increased more decisively. Indeed, the people in this age group are not considered part of the working-age population according to any statistical convention. However, the number of economically active persons among them rose from 100,000 in 2011 to 160,000 in 2016.

### EU citizens have higher labor market participation than Germans—non-EU citizens lag far behind

There are also differences in the labor market participation between German citizens and foreigners. And the foreign population must be divided into EU citizens and those with a nationality of other countries.

Among the EU population in Germany, overall participation was at higher than it was among Germans in 2016. Five years ago, that was not the case. The recent surge in migration in the EU has attracted more labor to Germany, and the participation rate among young migrants from the EU was higher than it is in Germany. This is a long-term trend.<sup>5</sup> With respect to age-specific participation, the trend was similar to that of the Germans: among middle-aged persons the already high participation rate plateaued from 2011 to 2016, and among older ones it rose. However, it is apparent that among EU citizens the differences between genders with regard to participation are greater than among Germans—precisely this has diverged in recent years. All in all, the key factor was the age structure of the migrants from the EU, which was favorable for the job market. If they had had the same age structure as Germans, their participation rate would have been much lower—by almost seven percent.

Among non-EU citizens living in Germany, the participation rate was far below the average across all age groups. And it has dropped sharply—except among older people. This could be due to the recent influx of asylum seekers, who as a rule receive a work permit only after having been granted a residence permit. However, as apparent in the immense difference in the participation rates of men and women, this is not the only reason. Traditional gender roles that exclude women from the job market are likely to exist among non-EU citizens from non-industrialized countries.

### Different effects of labor market participation and population growth on the potential labor force

The question arises as to what extent changes in participation behavior and the demographic change have contributed to potential labor force growth in recent years. The answer can be found in model calculations. Assuming that participation behavior in 2016 was the same as it was in 2011 and that the population structure with regard to age and gender did not change either—but the number of residents did—the effect of the change in number of population alone is highlighted. Holding only the participation rate constant highlights the effect that emerges due to changes in the composition of the working-age population. And adding the participation rate to the calculation yields information on the behavioral effect.

The key factor for potential labor force growth is increasing labor market participation. In the period from 2011 to 2016, it was just under one million persons (see Table 3), most of whom were women. By around 400,000 persons respectively, the pool grew due to population growth on the one hand and on the other, due to a change in the composition of the population that caused a shift toward the age cohorts with a relatively high participation.

However, the development looked very different depending on nationality. Among Germans, the number of working-age residents declined sharply, but this was compensated for primarily by increased labor market participation and a change in population composition. For women in particular it was significantly overcompensated. Among the EU citizens in Germany all of the variables had an influence on the growth of the potential labor force, but the most significant factor was population growth caused by migration. For persons from non-EU countries, the potential labor force also expanded primarily as a result of population growth. However, in this case the impact of the effect was dampened by reduced participation in the labor market.

### Well-qualified persons most frequently active in the job market

Participation behavior is closely related to professional education and training: the better the qualification, the higher the participation rate (see Figure 4). Qualifications may also be representative of other conditions. Usually people who are well educated have more interesting jobs and thus a higher intrinsic motivation to work. People with low qualifications often have physically taxing jobs and are frequently forced into early

<sup>5</sup> Karl Brenke and Nina Neubecker, "Struktur der Zuwanderungen verändert sich deutlich," *DIW Wochenbericht* no. 49 (2013): 3–21. (available online, Accessed August 10, 2017).



Table 3

**Components of the labor force change between 2011 and 2016 by gender and age**

Absolute change compared to 2011, in thousand persons

	Demographic effect		Behavioral effect = change of the participation rate compared to 2011	Total effect
	due to the change of the working age population (15 to 74) with a constant age and gender structure	due to the change in the age and gender structure of the 15 to 74 years old		
<b>Natives</b>				
Men	-534	216	339	20
Women	-467	77	815	425
Total	-1,001	293	1,154	445
<b>Foreigners - EU</b>				
Men	446	123	38	607
Women	357	-75	32	315
Total	804	48	70	922
<b>Foreigners - Non-EU</b>				
Men	350	123	-190	282
Women	238	-57	-37	144
Total	587	65	-226	426
<b>All nationalities</b>				
Men	261	461	187	910
Women	128	-55	810	883
Total	390	406	998	1,793

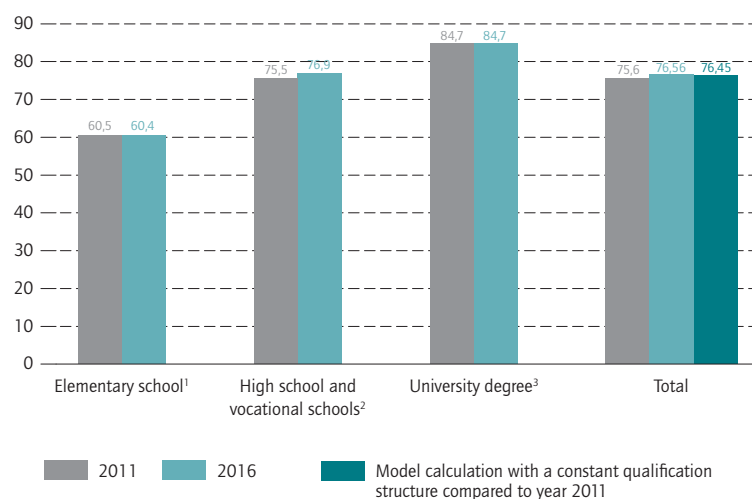
Source: Eurostat (Labor Force Survey); authors' own calculations.

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Figure 4

**Participation rates by education**

Labor force as a percentage of the population aged 20 to 69



1 ISCED 0 to 2.  
2 Including High-school degree, ISCED 3 to 4.  
3 ISCED 5 and higher.

Source: Eurostat (Labor Force Survey); authors' own calculations.

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retirement by physical wear and tear or stress due to monotonous tasks.

The overall level of qualification has continued to rise in recent years. The proportion of highly qualified people with an academic degree or master's certificate in the working-age population has increased<sup>6</sup>—to the detriment of people without professional education or training and those who have completed an apprenticeship or possess a vocational school degree (see Figure 5). Their proportion rose among women, and at the same time the proportion of women with low skills fell sharply. Among men, however, there is a disparity: both people with academic degrees and those with low skills have gained in importance, the latter due to migration.<sup>7</sup> The general rise in qualification level from 2011 to 2016 also had an impact on the participation rate. As the results of a fur-

6 Complete information is only available for persons between ages 20 and 69 in the source we used: the Eurostat "Labour Force Survey" database. (available online, Accessed August 10, 2017)

7 According to the results of the microcensus, the number of male non-EU citizens with personal migration experience (not including persons in training and children), who have not completed a professional education or training program, grew by a solid half a million between 2011 and 2016. See German Federal Statistical Office, "Bevölkerung mit Migrationshintergrund - Ergebnisse des Mikrozensus 2016," *Bevölkerung und Erwerbstätigkeit* series 1 vol. 2.2 (2016). (available online, Accessed August 10, 2017)

The better the education the higher labor market participation



ther model calculation showed,<sup>8</sup> the participation rate would have been 0.012 percent (equal to 60,000 persons) lower without the rise.

### Scenarios indicate future labor supply trend

Until now, Germany has been able to manage the demographic shift primarily due to a rise in labor market participation. However, the challenges will increase as more and more large birth cohorts—the baby boom generation—reach retirement age. The baby boom reached its peak in 1964. After the birth control pill hit the market, the number of births declined sharply until the beginning of the 1970s (see Figure 6).

To outline the consequences of this wave based on natural population movement, we calculated scenarios with a time horizon of 2040. Our intention was not to make a forecast. Instead, we wanted to outline the effects of specific influences. Our scenarios are based on the data of the 13th official coordinated population projections. For each of the scenarios, we calculated two variants: with and without a positive net migration.<sup>9</sup> We assumed an annual net migration of 200,000 persons across all age groups. That might seem conservative in light of the recent trend, but the official population projections did not contain higher surpluses. We ran five scenarios:

1) In the reference scenario (EU-PR), the future participation rate calculation was based on a time series model corresponding to the EU Commission’s methodology for determining growth potential.<sup>10</sup> With this approach, however, we assumed uniform participation behavior for the total working-age population. This ignores the fact that it varies significantly depending on age and gender. And we were unable to take changes in the age structure into account. According to this scenario, the potential labor force with zero net migration will expand slightly until 2020 but will shrink by 3.5 million people by 2040 (see Figure 7). With an annual net migration of 200,000 persons, the potential labor force will expand until 2025 but by 2035, will be lower than it was in 2016 (see Figure 8).

<sup>8</sup> We assumed that the qualification structure in 2016 was the same as it was in 2011 and that otherwise the population structure and employment behavior trends behaved as they actually did.

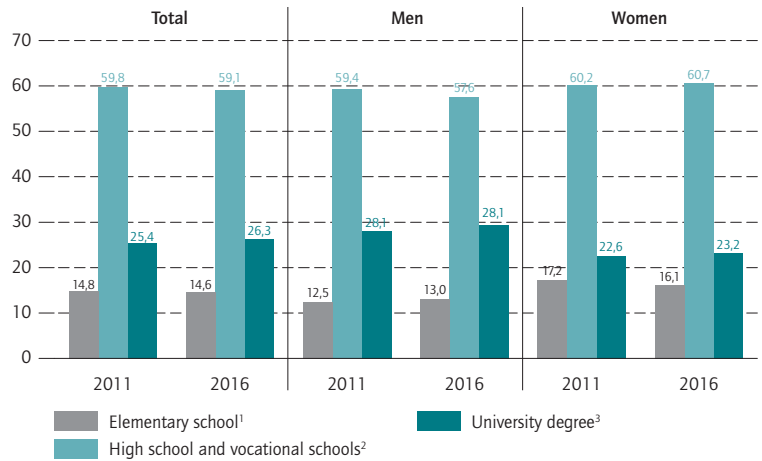
<sup>9</sup> We used the purely hypothetical variant (G1-L1-W0) with net migration to Germany of zero and the variant with net migration to Germany of 200,000 persons (G1-L1-W2).

<sup>10</sup> See Karel Havik et al., “The Production Function Methodology for Calculating Potential Growth Rates & Output Gaps,” *European Commission Economic Papers* 525 (2014). (available online, Accessed August 10, 2017)

Figure 5

### Population aged 20 to 69 by education

Share in percent



<sup>1</sup> ISCED 0 to 2.  
<sup>2</sup> Including High-school degree, ISCED 3 to 4.  
<sup>3</sup> ISCED 5 and higher.

Source: Eurostat (Labor Force Survey); authors’ own calculations.

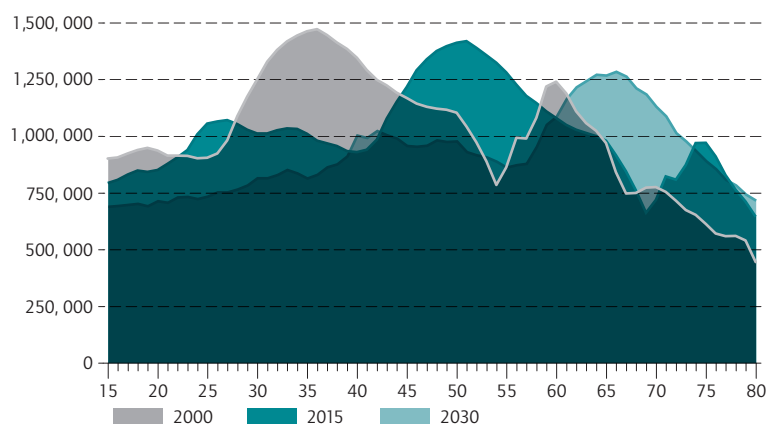
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The share of highly-educated working-age population increases.

Figure 6

### Population by single ages 2000, 2015, and 2030

Persons



Source: Federal Statistical Office (population update and national accounts).

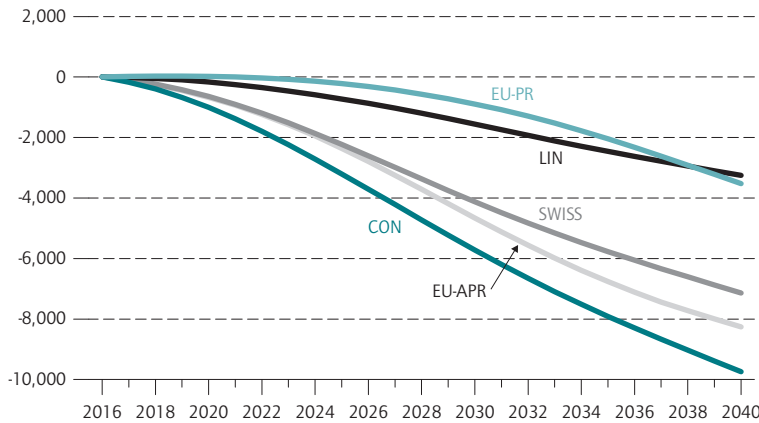
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More and more baby boomer reach their retirement age.

Figure 7

**Change of the potential labor force under different scenarios between 2016 and 2040 without net migration**

Thousand persons



Source: Eurostat (Labor Force Survey); Federal Statistical Office; authors' own calculations.

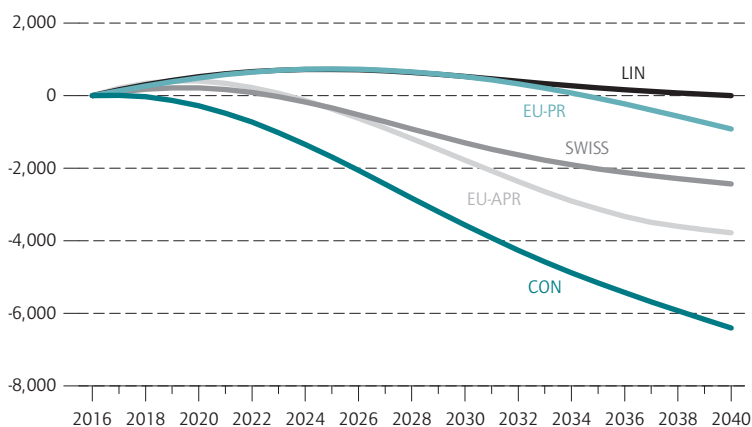
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With zero net migration the potential labor force will shrink.

Figure 8

**Change of the potential labor force under different scenarios between 2016 and 2040 with positive net migration**

Thousand persons



Source: Eurostat (Labor Force Survey); Federal Statistical Office; authors' own calculations.

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With positive net migration the loss would be much lower.

2) The second scenario (CON) assumes that employment behavior does not change after 2016 and therefore, only demographic influences will have an effect. Without migration, the potential labor force would lose a good 9.5 million persons by 2040. The loss would be compounded by the fact that the proportion of people in age cohorts with relatively low labor market participation (60- to 74-year-olds) will rise; while the proportion of middle-aged cohorts with higher participation will fall (see Table 4). Even if there is an annual gain in migration of 200,000 persons, the potential labor force would contain at least six million persons less in 2040 than it did in 2016. However, such a scenario is less likely, as there is no evidence that the current trend of changing participation will immediately and abruptly stop.

3) In a further scenario (LIN), alongside the demographic effects we assumed continued changes in labor market participation. The calculation was based on the presumption that the participation rate in the individual age groups and for both sexes would develop as it has on average for the past five years.<sup>11</sup> Without a migration surplus, the potential labor force would shrink by at least three million persons by the end of the projected horizon. Adding the above-mentioned migration surplus would reverse the decline in the number of employed people forecast for 2040. However, it is also unrealistic to assume a constant linear increase in the participation rate over the next 23 years because some age groups would exhibit implausibly high labor market participation as a result. For example, 55- to 64-year-olds would have a participation rate of 98 percent.

4) The time series method of the reference scenario can also be applied to individual age groups and calculated with age- and gender-specific participation rates, yielding different results.<sup>12</sup> In this scenario without a migration surplus (EU-APR), the potential labor force would shrink as early as the following year and encompass eight million fewer people by 2040. Adding back the migration surplus cuts the magnitude of the decline in half. However a major problem with these types of models is their systematic orientation to purely statistical efficiency crite-

<sup>11</sup> This results in a curve similar to that of the reference scenario, since a linear projection of the aggregated participation rate implicitly assumes that the cohort-specific participation rate also follows a linear trend. The difference is a result of the age-specific participation rates that achieve values over 100 percent due to the linear projection being restricted to the average value of the past three years, rendering them non-linear.

<sup>12</sup> With this approach, age-specific participation rates are estimated and extrapolated using ARIMA models. The selection of the optimal model for the respective age cohort is based on the usual information criteria.

ria, which makes interpreting the results contextually very difficult.<sup>13</sup>

5) In the last scenario (*SWISS*), we assumed that the age-specific participation rates of men and women would converge to today's participation rates in Switzerland by 2040. Switzerland is the optimal reference country because its economy is similar Germany's.<sup>14</sup> Unlike the other scenarios, this model also takes the differences in the participation behavior of German citizens and non-German citizens into consideration. Without net migration, the potential labor force would lose a good seven million persons by 2040. If there is a surplus of the magnitude included in the other scenarios, there would be a loss of 2.4 million employed persons, and the number would be lower than that of 2016 from 2023 onward. Unlike the model-driven projection, country-specific factors have an impact in the *SWISS* scenario. In Switzerland, the participation rate is higher than it is in Germany in general. And especially worthy of note is that the Swiss figures far surpass Germany's for people with German citizenship among men and women age 15 to 19, women age 20 to 34, and both women and men age 65 to 74 (see Table 5). The non-German population shows even greater differences—for women in particular and above all, for persons under 40. The differences between Germany and Switzerland are in part based on the differences in participation behavior of the non-German population in the two countries—and therefore on the differences in the social composition of the non-German population.

All of our scenarios yielded potential labor force shrinkage by 2040—only the extent and timing of the decrease varied. If we assume that positive net migration will be significantly lower than they have been recently, a decrease in the economically active population is also unavoidable. However, the loss would be much lower than it would be in the case of a zero net migration.

**13** This is why structural models for Germany should be verified for further research. See the preparatory work by Bruce C. Fallick and Jonathan F. Pingle, "A Cohort-based Model of Labor Force Participation," *Finance and Economics Discussion Series 2007-09* (2006). (available online, Accessed August 10, 2017) and Almut Balleer Ramón Gómez Salvador, and Jarkko Turunen, "Labour Force Participation across Europe: A Cohort-based Analysis," *Empirical Economics* 46(4) (2014): 1385-1415. (available online, Accessed August 10, 2017)

**14** For example, the manufacturing industry was responsible for 19 percent of gross value added in Switzerland in 2015, and in Germany the proportion was 23 percent. The service sector accounted for the remaining gross value added almost entirely as agriculture plays a minimal role in both countries. Further, Switzerland is an immigration country that must deal with the effects of its future demographic shift. And the job market situation in Switzerland has also developed very favorably in recent years.

Table 4

**Components of the change in the native potential labor force between 2016 and 2040**

Absolute change compared to 2016, thousand persons

	Demographic effect (CON)	Behavioral effect			Total effect		
		LIN <sup>1</sup>	EU-APR <sup>2</sup>	SWISS <sup>3</sup>	LIN <sup>1</sup>	EU-APR <sup>2</sup>	SWISS <sup>3</sup>
15-19	24	-334	-303	630	-310	-279	654
20-24	-571	-155	-5	270	-726	-576	-301
25-29	-1,047	52	-211	183	-996	-1,259	-864
30-34	-1,155	21	103	111	-1,134	-1,051	-1,044
35-39	-920	44	112	50	-876	-808	-870
40-44	-1,049	38	569	12	-1,011	-481	-1,037
45-49	-1,452	192	-347	27	-1,260	-1,799	-1,424
50-54	-1,617	273	-159	89	-1,344	-1,776	-1,528
55-59	-1,341	592	288	122	-749	-1,053	-1,219
60-64	-650	1,385	599	154	735	-51	-496
65-69	89	3,126	445	377	3,215	534	466
70-74	135	1,070	207	392	1,205	342	527
15-74	-9,554	6,304	1,296	2,419	-3,251	-8,258	-7,136

	Demographic effect (CON)	Behavioral effect			Total effect		
		LIN <sup>1</sup>	EU-APR <sup>2</sup>	SWISS <sup>3</sup>	LIN <sup>1</sup>	EU-APR <sup>2</sup>	SWISS <sup>3</sup>
15-19	24	-260	-315	921	-236	-291	945
20-24	-451	-332	5	441	-783	-446	-10
25-29	-918	-28	-119	385	-946	-1,037	-533
30-34	-951	-134	288	314	-1,085	-664	-637
35-39	-564	-165	116	235	-729	-448	-329
40-44	-440	-81	698	144	-520	259	-296
45-49	-787	166	-196	138	-620	-983	-649
50-54	-1,096	180	-40	183	-916	-1,136	-913
55-59	-972	631	294	199	-341	-678	-773
60-64	-433	1,716	1,210	135	1,283	776	-299
65-69	135	3,426	399	380	3,561	534	515
70-74	150	1,179	184	397	1,328	334	547
15-74	-6,304	6,299	2,524	3,872	-5	-3,780	-2,433
Migration effect	3,250	745	1,228	1,453	3,995	4,478	4,703

<sup>1</sup> In scenario LIN the age-specific participation rates are projected by using 5-years averages of the growth rate

<sup>2</sup> In scenario EU-APR age-specific participation rate are projected by using ARIMA-models

<sup>3</sup> In scenario SWISS the age-specific participation rates of men and women converge to the respective Swiss participation rate until 2040

Source: Eurostat (Labor Force Survey); authors' own calculations.

**Conclusion**

As running several model variants has shown, further increases in the participation rate will not do the job of compensating for diminishing potential labor force in the future. At the same time, the available working force should be encouraged to remain in the job market for as long as possible. Political intervention, such as the "Retirement at 63" plan, are just as counterproductive as the existing support for partial retirement with regard

Table 5

**Difference between age-specific Swiss and German participation rates by gender and country of origin**

Percentage points

	Participation rate difference of natives in percentage points			Participation rate difference of foreigners in percentage points			Participation rate difference of total population in percentage points		
	Women	Men	Total	Women	Men	Total	Women	Men	Total
15-19	28	27	28	27	29	28	28	27	27
20-24	14	4	9	26	20	22	6	7	7
25-29	8	4	6	25	18	21	15	7	11
30-34	5	3	4	24	12	17	10	7	8
35-39	3	1	2	18	9	14	7	4	5
40-44	-2	3	0	10	8	9	4	3	3
45-49	-1	2	1	10	5	8	-1	3	1
50-54	2	2	2	8	8	9	-1	2	1
55-59	4	3	3	9	8	9	1	3	2
60-64	2	7	4	0	-5	-1	3	3	3
65-69	6	12	9	1	0	1	1	5	3
70-74	5	10	7	3	0	2	6	10	8
15-74	5	5	5	18	12	15	5	9	7

Source: Eurostat (Labor Force Survey); authors' own calculations.

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to taxes and social security contributions.<sup>15</sup> These privileges should be abolished.

<sup>15</sup> Although the supplemental contributions paid by employers are exempt from taxes and social security contributions (see § 3 no. 28 Income Tax Act (*Einkommensteuergesetz*, (EStG)), they are subject to a progression proviso. This is essentially a wage component.

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JEL: E24, J11, J21

Keywords: Labor force, labor market participation, demographic shift, migration

The model calculations until 2040 presented in this study should only be interpreted as indications of the importance of individual determinants that have an influence on the future potential labor force—not as forecasts of its dimensions. It would be virtually impossible to make a scientifically sound forecast of this type, just as it would be to quantify the anticipated labor requirement. After all, supply and demand are mutually dependent. When labor supply becomes scarcer, its price—that is, wages—rises. Higher earned income could attract labor participation from outside Germany to precisely the market segments most in need of a larger labor force. These would probably involve highly demanding jobs that require a labor force with the relevant qualifications.

On the other hand, rising wages would force companies to increase their productivity in order to use labor more efficiently. In this respect, there is plenty of room to maneuver: in Germany, productivity and investment growth have been in the doldrums in recent years. Whether an increasingly qualified labor force is motivated to migrate to Germany or German companies become more productive and innovative, the result in either case would be positive from an economic viewpoint. The demographic change should be viewed as an opportunity and not a risk. After all, the entire history of mankind shows that necessity is the mother of progress.

# Income, social support networks, life satisfaction: lesbians, gays, and bisexuals in Germany

By Martin Kroh, Simon Kühne, Christian Kipp and David Richter

Towards the very end of this legislative period, a cross-caucus parliamentary majority gave same-sex marriage the green light – progress for the legal equality of homosexuals in Germany. This report focuses on the life situations of homosexual and bisexual people in Germany. The careers they pursue, for example, differ from those of heterosexuals. Hourly wages are an area of significant disparity: homosexual and bisexual men earn less per hour than heterosexual men with the same qualifications in comparable professions. While differences in personality structure are virtually nonexistent, homosexuals and bisexuals describe themselves as less satisfied with their lives and under more psychological stress. An analysis based on the data from the Socio-Economic Panel (SOEP) at the German Institute for Economic Research yielded these and other results. The SOEP is one of the few representative population surveys in Germany that collects information on the sexual orientation of participants. Expanding the scope of regular social reporting to include data on sexual orientation would make it possible to better document differences in life situations and to more effectively identify where action is needed – such as in fighting discrimination.

Equal rights for homosexuals have been a hot topic of debate in Germany for some time now, but representative population survey data on lesbians, gays, and bisexuals (abbreviated as “LGBs,” see Box 1) are relatively rare. This is surprising because the European Union’s Charter of Fundamental Rights prohibits discrimination based on sexual orientation,<sup>1</sup> and EU institutions have repeatedly advised member states to monitor the equality of LGBs in various areas of life.<sup>2</sup>

## Box 1

### Collecting LGB statistics

In the present report, we call people who self-identify as sexually attracted to members of their own sex “LGB” (lesbian, gay, and bisexual). The SOEP report was based on the responses of 459 homosexuals and bisexuals and 39,100 heterosexual respondents (unweighted number of cases). Due to the comparatively low number of LGB cases, we did not systematically differentiate among lesbians, gays, and bisexuals within the LGB group. We concentrated primarily on comparing LGB respondents on the one hand with heterosexual respondents on the other.

Further consideration of gender identity would permit a more detailed differentiation into LGBTIQ: lesbian, gay, bisexual, trans, intersex, and queer. However, even with the overall number of cases in the SOEP, statistically robust statements that can be made involving sexual orientation and gender identity are limited.

<sup>1</sup> Charter of Fundamental Rights of the European Union (2000). (Available online, accessed August 8, 2017; the same also applies for all other online sources mentioned in this report unless stated otherwise).

<sup>2</sup> See for example European Parliament, “Resolution of 4 February 2014 on the EU roadmap against homophobia and discrimination on grounds of sexual orientation and gender identity,” (available online).

## Box 2

**On surveying sexual orientation in the SOEP**

The sexual orientation of respondents to the Socio-Economic Panel (SOEP), a recurring annual representative survey of private households in Germany,<sup>1</sup> is measured based on two strategies.

Since the first survey in 1984, the SOEP has included information on the composition of participating households (Household Questionnaire) and the individual information of the respondents (Individual Questionnaire), both of which are updated annually. More specifically, it includes the relational structure of all persons living in the household. In this way, it is possible to identify kinship (e.g., mother/child) and partnerships (e.g., wife/husband) among the members of a household. Information on the respondent's sex and that of their partner in the household allows for distinguishing between different- and same-sex couples. We considered the SOEP survey period from 2010 to 2016 for our analyses. People who had a partner of the same sex in one of the years in this period were assigned to the LGB group. People who lived with a partner of a different sex for at least two years and had never had a partner of the same sex were assigned to the heterosexual group.<sup>2</sup>

**1** Gert G. Wagner et al., "Das Sozio-oekonomische Panel (SOEP): Multi-disziplinäres Haushaltspanel und Kohortenstudie für Deutschland – Eine Einführung (für neue Datennutzer) mit einem Ausblick (für erfahrene Anwender)", *AStA Wirtschafts- und Sozialstatistisches Archiv* no. 2.4 (2008): 301–328.

**2** People who indicated for one year only that they had had a partner of a different sex could be either hetero or bisexual. For this reason, we determined that two years of information on heterosexual partnerships would be an adequate filter for reducing the number of bisexual respondents that were incorrectly grouped with heterosexuals. Nor is it sufficient to use information on partners of different sexes for the same person as a criterion for distinguishing between bisexual respondents and homosexual

The approach described above does not allow for statements about people who are not in a relationship or couples who "live apart together." And bisexual respondents in stable partnerships with a person of the opposite sex are incorrectly grouped with heterosexuals. These are the main reasons why a direct question about sexual orientation was integrated into the SOEP core sample questionnaire in the 2016 survey. Participants were asked whether they consider themselves heterosexual, homosexual (lesbian or gay), bisexual, or none of the above.<sup>3</sup>

Yet the direct question about sexual orientation is not without possible sources of error. In 2016, almost 13 percent of respondents refused to answer the question, either by refusing to answer outright or by selecting the answer "None of the above." Because we can assume that LGB respondents in particular decided not to answer the question due to their fear of rejection by the interviewer or in order to criticize the question itself,<sup>4</sup> we applied a correction factor when calculating the proportion of LGBs in the adult population. It gives a higher weighting to respondents who possess the typical characteristics of those who refused to answer. For example, this applies to older people, to

respondents, since both bisexuals and homosexuals could have a stable relationship with a partner of the same sex.

**3** The exact wording of the question is: "In the context of relationships, the question of sexual orientation arises. Would you describe yourself as ...?" The available answers were "Heterosexual or straight (that is, attracted to the opposite sex)", "Homosexual (gay or lesbian, that is, attracted to the same sex)", "Bisexual (attracted to both sexes)", "Other" and "No answer/Prefer not to say".

**4** On possible problems involved in sensitive survey subjects, see: Roger Tourangeau and Ting Yan, "Sensitive Questions in Surveys," *Psychological Bulletin*, 133(5) (2007): 859–883.

However, even seemingly trivial facts, such as the total number of LGBs living in Germany, are based on rough estimates at best (see Box 2). And based on the 2016 microcensus, the German Federal Statistical Office (*Statistisches Bundesamt*) reported that 0.46 percent of cohabiting couples in Germany are of the same sex<sup>3</sup>, but little is known about how many persons living without

a partner—around one-third of the adult population<sup>4</sup>—are hetero-, bi-, or homosexual.

The Socio-Economic Panel (SOEP) at the German Institute for Economic Research (DIW Berlin) is attempting to close this research gap by not only collecting data on the sex of two partners in a surveyed household but also requesting voluntary information on respondents' sexual orientation. The SOEP encompasses a wide range of subjects, including everything from employment, social

**3** The German Federal Statistical Office reported 95,000 cohabitating same-sex couples and 20,612,000 cohabitating couples in Germany in total. See Destatis (2017): Gleichgeschlechtliche Lebensgemeinschaften. (accessible online, last access August 24th, 2017); and Destatis (2017): Paare nach Lebensform (accessible online, last access August 24th, 2017);

**4** Elle Krack-Roberg et al., "Familie, Lebensformen und Kinder," *Datenreport 2016: Sozialbericht für Deutschland*, (PDF, German Federal Statistical Office (Destatis), Wiesbaden, 2016) (available online).



people with a partner in the household, and to specific survey modes.<sup>5</sup>

Another possible source of error is incorrect information provided intentionally to meet presumed societal expectations. This is why the analyses and estimates presented in this report refer solely to LGBs who live openly as such.

In all likelihood, the extent of incorrect information and the resulting underestimation of the proportion of LGB respondents vary across age groups (see Table). Not unexpectedly, at 25 percent, the proportion of 17- to 29-year-olds among LGBs in the SOEP sample is twice as high as the proportion of this age group among heterosexual respondents. The reverse holds true among respondents age 60 and over: 15 percent of the LGBs and 34 percent of the heterosexuals in the sample are in that age group. The average LGB age is 42, which is significantly lower than that of heterosexuals at 52.<sup>6</sup>

Differences in the life situations of hetero and LGB respondents could simply be due to the measured differences in age. In order to enable comparisons between LGBs and heterosexuals despite that fact, we used the "Propensity Score Weighting" method

**5** Initial analyses indicate that in a face-to-face survey situation, respondents refuse to provide information on their sexual orientation less often than respondents who complete the interview on their own. However, in face-to-face interviews, the frequency of LGB identification decreases. A similar pattern is evident when a third person is present during the interview.

**6** Although a biological mechanism of sexual orientation should be independent of age, the age-dependent differences indicate that a social process is involved in the reported identification with a sexual orientation.

by age group. We weighted the subsample of heterosexual respondents to make their age distribution correspond to that of the relevant distribution of the LGB subsample. Weighted in this way, the data allow for comparison between LGBs and heterosexuals of the same age. For informational purposes, the tables also contain the values for heterosexual respondents without adjustment for age.

To classify the SOEP study participants as hetero, bi-, or homosexual, we used both self-reported information on sexual orientation as well as information on the sex of current and former partners.

Table

**Gender and age**  
Share in percent

	Heterosexual (1)	LGBs (2)	Difference (1-2)
Women	51	53	
Age (mean)	51,9	41,6	**
17 to 29	13	25	**
30 to 44	24	33	**
45 to 59	30	27	
60 and over	34	15	**

Significance levels: \*:  $p < 0.05$ ; \*\*:  $p < 0.01$ .

Sources: Socio-Economic Panel v33.beta; authors' own calculations.

Example: 17- to 29-year-olds make up 13 percent of the heterosexual adult population and 25 percent of the homosexual and bisexual adult population.

networks, health, and wellbeing to personality structures. This allows for an overview of differences and similarities in heterosexual and LGB respondents in various areas of life.

**More lesbians, gays, and bisexuals live in Germany than recorded in official statistics**

Based on the 2016 microcensus, the German Federal Statistical Office has released its most up-to-date figure: 95,000 same-sex couples living together in one household—an increase of 53 percent in ten years. However, related to all cohabiting couples in Germany in 2016, same-sex couples only represent a proportion of 0.46 percent. In other Western countries that publish comparable

data, the proportion is in some cases two times higher. For example, the United States Census Bureau reported a proportion of one percent same-sex couples; Statistics Canada reported 0.9 percent, and the value for France is 0.6 percent.<sup>5</sup>

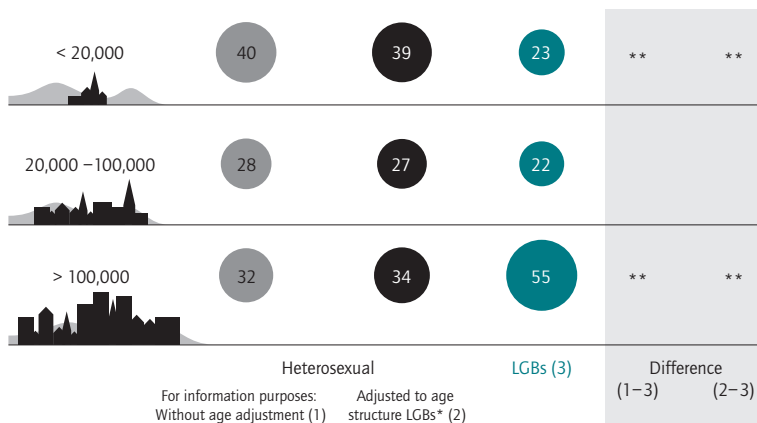
**5** For an overview, see Andrea Lengerer, "Quality of Official Data on Cohabiting Same-Sex Couples in Germany," presentation at 7th Conference of the European Survey Research Association (ESRA), 2017. For information on the US, see: Daphne Lofquist et al., "Households and Families: 2010," *2010 Census Briefs*, (PDF, United States Census Bureau, Washington, D.C., 2013). (available online; accessed July 22, 2017) and Martin O'Connell and Sarah Feliz, "Same-sex couple household statistics from the 2010 census," *Social and economic household statistics division working paper 2011-26* (2011). (available online; accessed July 22, 2017) For a discussion on methodology in determining these values for the US, see Theresa J. DeMaio, Nancy Bates, and Martin O'Connell, "Exploring Measurement Error Issues in Reporting of Same-Sex Couples," *Public*



Figure 1

**Municipality size classes**

Share in percent

Significance levels: \*:  $p < 0.05$ ; \*\*:  $p < 0.01$ .

Sources: Socio-Economic Panel v33.beta; authors' own calculations.

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## LGBs live in small municipalities less often than heterosexuals.

In the 2016 SOEP survey, the estimated number of same-sex couples in private households was 0.9 percent. Due to sampling error, which leads to uncertainty in the estimates, the value lies between 0.7 percent (lower estimate) and 1.1 percent (upper estimate) of all cohabiting couples in Germany. When respondents' partnership information from earlier SOEP surveys is added, the proportion rises above 1 percent.

With this method, LGBs who do not currently have a partner or do not cohabit with their partner are not recorded. Survey-based studies must rely solely on the voluntary self-disclosure of sexual orientation (see Box 2). On the basis of this information, we estimated that approximately 1.9 percent of adults in Germany self-identify as homo- or bisexual (lower estimate 1.6 percent; upper estimate 2.2 percent). At just below three percent, the proportion of LGBs who live alone is significantly higher than that of LGBs cohabiting with a partner (1.3 percent). And at 2.8 percent, people under 45 self-identify as LGB more frequently than people over 60 (just below one percent).

In the UK and Australia, where self-reported information on sexual orientation is collected in large household

*Opinion Quarterly* 77 (2013): 145-158. For information on Canada, see Heather Lathe et al., "Same-sex couples in Canada in 2016," (PDF, Census in Brief Statistics Canada, Ontario, 2017). (available online; accessed July 22, 2017). For information on France, see Clara Cortina and Patrick Festy, "Same-sex couples in the census," (News article, Institut National D'Études Démographiques, Paris, 2017). (available online; accessed July 22, 2017)

surveys similar to the SOEP, the estimated proportion of LGBs in the population is somewhat higher than in Germany. In the UK, LGBs make up an estimated 2.3 percent of the population, based on data from 2012 and the UK Household Longitudinal Study (UKHLS). In Australia, based on data from the Household, Income and Labour Dynamics in Australia (HILDA) survey, LGBs make up an estimated 2.6 percent of the population.<sup>6</sup>

It is important to remember that these are estimates of the number of people who are in openly homosexual living situations or who identified as such in an interview situation, not those with homosexual tendencies in the general population. The latter figure is probably considerably higher, but there are virtually no studies to date that could provide a reliable estimate.<sup>7</sup>

**Most registered civil partnerships in Germany are in Berlin**

More than half of lesbians, gays, and bisexuals in Germany live in major cities with over 100,000 residents, compared to only around one-third of heterosexuals (Figure 1). The sample size of the microcensus conducted by the German Federal Statistical Office is not large enough to deliver a reliable estimate of the proportion of same-sex couples in Germany's large cities. However, registry office data on registered civil partnerships (*Lebenspartnerschaften*) and marriages of same-sex couples show that in 2015, the most same-sex unions by far were in Berlin (834), followed by Cologne (291) and Hamburg (251) (Figure 2). Of all civil partnerships and marriages registered in Berlin, 5.7 percent were of same-sex couples. This puts Germany's capital city at the top of the five largest German cities when it comes to the proportion of registered civil partnerships, followed by Cologne and Frankfurt/Main with five percent each. Schleswig-Holstein and Saarland are the federal states with the highest proportion of new registered civil partnerships (both over two percent).<sup>8</sup>

<sup>6</sup> For the calculation, the unweighted numbers of LGBs were considered in relation to the sum of respondents who identify themselves as either LGB or hetero. See Mark Wooden, *The Measurement of Sexual Identity in Wave 12 of the HILDA Survey - and Associations with Mental Health and Earnings*, (Melbourne, University of Melbourne, 2014). For an overview, also see Gary J. Gates, "How Many People are Lesbian, Gay, Bisexual and Transgender?" (PDF, The Williams Institute/University of California, Los Angeles, 2011). (available online; accessed July 22, 2017)

<sup>7</sup> Based on a widely cited Internet survey, Dalia Research estimates the proportion of LGBT (lesbian, gay, bisexual, and transsexual) people in Germany at 7.4 percent—far more than all other estimates. We do not have any information on the survey's sampling and measurement errors. See Dalia Research, "Counting the LGBT Population," (Website, Dalia Research, Berlin, 2017). (available online; accessed July 22, 2017)

<sup>8</sup> At 1.8 percent of all same-sex marriages or registered civil partnerships in 2015, the proportion of newly established same-sex partnerships throughout Germany is four times higher than the proportion of same-sex couples among

## LGBs are less likely to be in a relationship and more likely to have support networks outside the family

According to the SOEP data, lesbians, gays, and bisexuals are less likely to be in a relationship than heterosexuals (Figure 3). Both the proportion of singles and the proportion of individuals “living apart together” are higher in the LGB community. While around 70 percent of all respondents in same-sex relationships reported living with their partner in the same household, the proportion among heterosexual couples of the same age is over 10 percent higher.

Ten percent of homosexual and bisexual respondents indicated that they live in a household with a child under 14. Among heterosexuals in the same age range, the proportion was 27 percent.<sup>9</sup> This does not necessarily presume a parent/child relationship.

While 28 percent of cohabiting heterosexuals live in single-income households, the proportion is significantly lower among homosexual couples at 18 percent. The proportion of dual-income households is accordingly higher among same-sex couples.

### Social support networks

At regular intervals, SOEP respondents report on their social support networks: the “persons with whom they share their thoughts and feelings or talk about things they would not tell just anyone,” or “who they would ask for help in the hypothetical case of requiring long-term care after a serious accident, for example.”

There is no statistically significant difference between LGBs and heterosexuals when it comes to the existence of a support network (see Table 1). Only around six percent of LGB respondents and approximately four percent of heterosexuals reported that they do not have a confidant with whom they share their personal thoughts and feelings. Nine and five percent, respectively, indicated that they would have no one to turn to for help if they needed long-term care. And regardless of their sexual orientation, most respondents viewed their partner as an important source of support. Around 90 percent

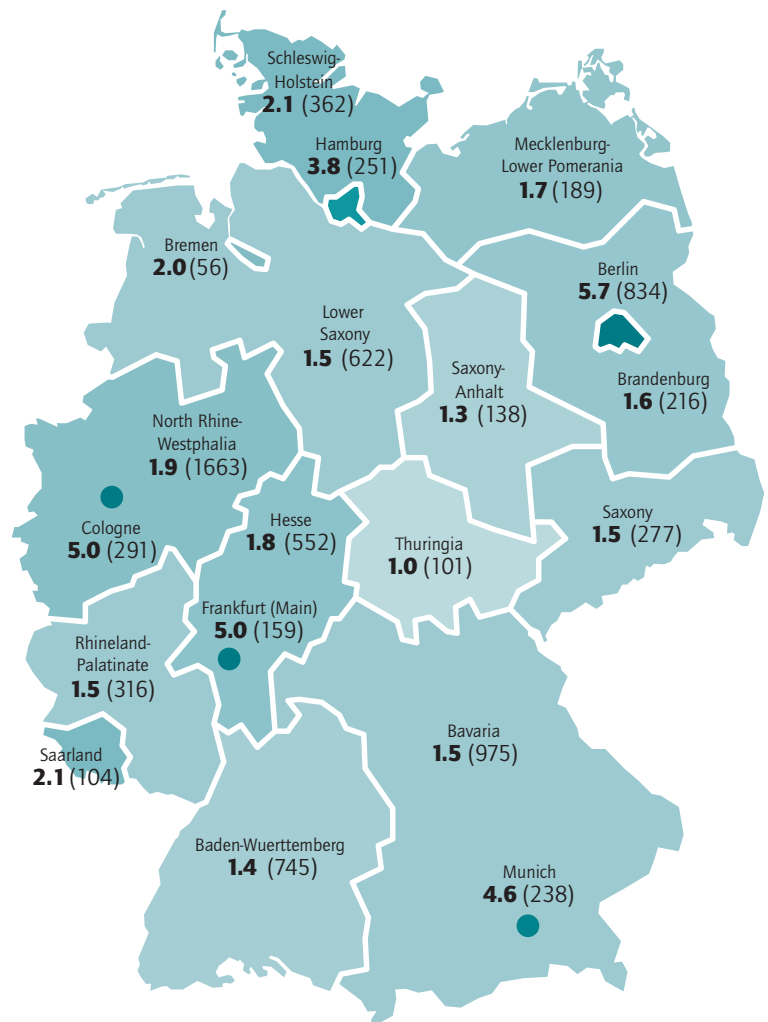
all couples in the 2016 microcensus (0.46 percent). This discrepancy can be due to many reasons, for example, differences in age. However, it could also be due to the underrepresentation of same-sex couples in surveys.

<sup>9</sup> Based on the 2012 microcensus on cohabiting same-sex and different-sex couples, this difference is higher (authors' calculations based on the Scientific Use File), in particular because the proportion of heterosexual couples that live with children in one household is higher. This tendency is also apparent when heterosexual SOEP respondents are limited to the group of persons living in partnerships.

Figure 2

### Newly registered civil partnerships in 2015

By large cities and federal states, share in percent, absolute figures in brackets



Percentage of the total number of (heterosexual) marriages and newly formed (homosexual) civil partnerships.

Sources: DESTATIS, Federal Statistical Office (available online); Bavarian State Office for Statistics and Data Processing; Cologne Registry Office; City of Frankfurt.

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Berlin, Cologne and Frankfurt/Main are the German cities with the most registered same-sex partnerships.

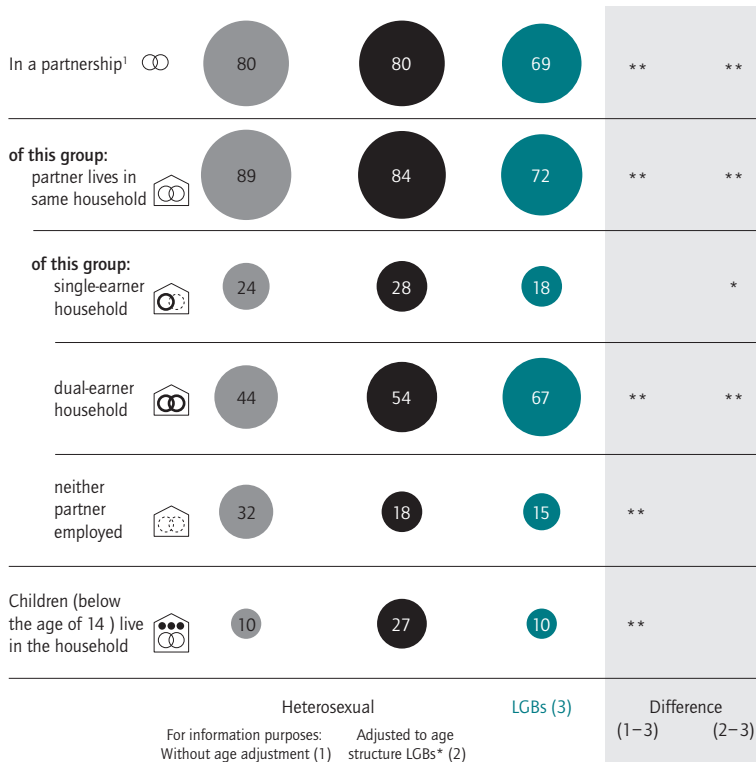
shared personal thoughts and feelings in their partnership and approximately 80 percent would ask their partner for help in need of long-term care.

Statistically significant differences between LGBs and heterosexuals emerged from the questions on the importance of family and the importance of friends and acquaintances. The proportion of homosexual and bisexual respondents who said family members (parents, siblings, children and

Figure 3

**Forms of cohabitation**

Share in percent



Significance levels: \*:  $p < 0.05$ ; \*\*:  $p < 0.01$ .

Sources: Socio-Economic Panel v33.beta; authors' own calculations.

1 Since we use respondents' answers regarding relationships, if given, to measure sexual orientation, our analysis overestimates the overall number of people in a relationship.

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Dual-earner households are more prevalent among LGBs than heterosexual couples.

other relatives) were their confidants (61 percent) or persons who they would turn to if they needed long-term care (56 percent) was around ten percentage points lower in each case than it was for heterosexual respondents of the same age (72 percent and 67 percent respectively). At the same time, the proportion of persons who counted friends and acquaintances among their support network was ten percent higher for LGBs than for heterosexuals (59 percent vs. 46 percent said friends and acquaintances were their confidants and 36 percent vs. 28 percent would turn to friends if they needed long-term care).<sup>10</sup>

<sup>10</sup> Karsten Hank and Veronika Salzburger, "Gay and Lesbian Adults' Relationship With Parents in Germany," *Journal of Marriage and Family* 77 (2015) found that based on data from pairfam - The German Family Panel, there is no difference in the ties between hetero- and homosexual children and their parents in the long term. However, other studies suggest that when homosexuals

Table 1

**Social support networks**

Share in percent

	Heterosexual		LGBs (3)	Difference (1-3)	Difference (2-3)
	For information purposes: Without age adjustment (1)	Adjusted to age structure LGBs (2)			
<i>Confidants<sup>1</sup>:</i>					
No one	4	4	6		
Partner (if any) <sup>2</sup>	92	91	89		
Family	68	72	61		**
Friends and acquaintances	40	46	59	**	**
<i>Support if need for care should arise<sup>1</sup>:</i>					
No one	6	5	9		
Partner (if any) <sup>2</sup>	81	80	82		
Family	63	67	56	*	**
Friends and acquaintances	29	28	36		*
Number of close friends	4.1	4.2	4.3		

1 Data on respondents' social support networks was collected with the questions: "In the following, we list people who might be important to you in some way. Who is most important to you when it comes to the following: Who do you share your thoughts and feelings with or talk to about things you would not tell just anyone?" and "Hypothetically, who would you ask for help if you needed long-term care, for instance, after a serious accident?" Respondents could name up to five persons in response to each question.

2 Only including respondents who stated that they were in a relationship.

Significance levels: \*:  $p < 0.05$ ; \*\*:  $p < 0.01$ .

Sources: Socio-Economic Panel v33.beta; authors' own calculations.

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**LGBs pursue different careers and earn less**

**Education, gainful employment, and occupational status**

On average, SOEP respondents who identified themselves as lesbian, gay, or bisexual had somewhat higher educational levels than heterosexual respondents: more LGB respondents had university entrance qualifications as opposed to intermediate secondary or lower secondary school diplomas (Table 2). Forty-seven percent of LGBs reported having university entrance qualifications,

or bisexuals come out, this often has an adverse effect on relationships within the family.

Table 2

**Education and career**

Share in percent

	Heterosexual		LGBs (3)	Difference (1-3)	Difference (2-3)
	For information purposes: Without age adjust- ment (1)	Adjusted to: Age structure LGBs (2)			
<i>Education</i>					
Tertiary or Polytechnical Degree	21	21	26		
University Entrance Qualification	10	15	21	**	*
Intermediate Secondary/Lower Secondary with Vocational Training	50	43	32	**	**
Intermediate Secondary/Lower Secondary without Vocational Training	14	14	16		
No Secondary Diploma/in Vocational Training	4	8	6		
<i>Career</i>					
Non-Employed (e.g., retired, in training)	34	22	18	**	
Unemployed	6	6	9		
Occupational position (employed people)					
Blue-collar worker	25	23	11	**	**
White-collar worker	58	61	78	**	**
Self-employed	10	9	9		
Civil servant	7	6	2	**	**
<i>Sectors</i>					
Resource Extraction, Production, and Manufacturing	18	17	11	*	
Construction, Architecture, Surveying, and Building Technology	6	5	6		
Natural Science, Geography, and Information Science	5	5	3	*	
Transportation, Logistics, Security and Safety	14	13	8	*	
Commercial Services, Trade, Marketing, Hotels and Tourism	13	15	13		
Company Organization, Bookkeeping, Law and Administration	18	18	21		
Health, Social Services, Teaching and Education	21	23	27		
Humanities and Social Sciences, Media, Arts, and Culture	3	4	8		
Other	1	1	2		

Significance levels: \*:  $p < 0.05$ ; \*\*:  $p < 0.01$ .

Sources: Socio-Economic Panel v33.beta; authors' own calculations.

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compared to 36 percent of heterosexuals. These differences have a certain level of statistical uncertainty but appear to be reliable, as our analyses of the 2012 micro-census showed a similar pattern. It is striking that such a low percentage of LGBs completed vocational training after graduating with an intermediate or lower secondary diploma.

In contrast to heterosexuals, homosexual and bisexual workers are less often employed as blue-collar workers (11 vs. 23 percent) and more often as white-collar workers (78 percent vs. 61 percent for heterosexuals). And at two percent, the proportion of civil servants in the LGB community is particularly low (for heterosexuals, six percent). Looking at the results by sector, comparatively few LGBs indicated that they were employed in

manufacturing or in the transportation, logistics, security and safety sector.<sup>11</sup>

**"Sexuality pay gap" among men**

We also compared homosexuals and bisexuals to heterosexuals with regard to their gross hourly wages (measured by actual hours worked<sup>12</sup>) (Figure 4). Heterosexual

<sup>11</sup> The sampling error is quite high due to the low number of cases, but in our own analyses of the 2012 Microcensus Scientific Use File, we find similar differences by sector.

<sup>12</sup> Even if contractual instead of actual working hours are used to calculate hourly wages in the SOEP, homosexual and bisexual men still have lower hourly wages, but the difference from those of heterosexual men is not as large. The extent to which average hours worked exceed contractual working hours is significantly higher among homosexual and bisexual men than among heterosexual men.

Figure 4

**Sexuality pay gap in gross hourly wages**

Values in euros



1 Gross hourly wages calculated based on actual number of hours worked as reported by respondent.

2 Controlling for age, occupational status, sector, full-time/part-time, experience in full-time/part-time work, and qualifications.

3 Sum of a household's net monthly income weighted by household size and composition (new OECD scale).

Significance levels: \* $p < 0.05$ ; \*\* $p < 0.01$ .

The grey background indicates significant results.

All estimates for heterosexuals are adjusted to the age structure of LGBs.

Sources: Socio-Economic Panel v33.beta; authors' own calculations.

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**Gay and bisexual men earn less than heterosexual men.**

men earn considerably higher hourly wages (average hourly wage of 18.14 euros) than heterosexual women (14.40 euros), bi-/homosexual women (16.44 euros) and bi-/homosexual men (16.00 euros). These differences persisted even when we statistically controlled for differences in qualifications, occupational status, professional experience, working time models, and sectors. The difference between men rose to 2.64 euros when we controlled for the higher education levels of homosexual and bisexual respondents. The hourly wages of bi-/homosexual women did not differ from those of bi-/homosexual men or heterosexual women with any statistical significance.

Alongside the well-documented gender pay gap<sup>13</sup> (women earning lower wages), the data indicate a sexuality pay

<sup>13</sup> See the definition of the gender pay gap in the DIW glossary (in German only, available online). For studies, see Anne Busch and Elke Holst, "Verdienstunterschiede zwischen Frauen und Männern nur teilweise durch Strukturmerkmale zu erklären." *DIW Wochenbericht* no. 15 (2008): 184-190; Claudia Gather

gap that affects homosexual and bisexual men to a significant extent. The observed sexuality pay gap in Germany is similar to that in other Western countries.<sup>14</sup>

Because there are more dual-income households in the LGB community and the households are smaller than those of heterosexuals on average, the wage difference does not pose a disadvantage with regard to disposable household income.

**LGBs are less satisfied with their lives and more likely to suffer from depression**

Previous research has found that LGBs have a lower sense of wellbeing and higher risk of psychological problems.<sup>15</sup> It is argued that due to their sexual orientation, LGBs are stigmatized and discriminated against, triggering a condition of chronic stress. However, there is a positive relationship between social and self-image based on the extent of one's "outness"—that is, the degree to which a person's actual homosexual self-image matches the image that he/she presents to society.<sup>16</sup>

As a measure of psychological health, the SOEP provides a value that is a weighted combination of the answers to five individual questions, for example: "In the past four weeks, how often have you felt down and gloomy?" or "[...] how often have you felt that you achieved less than you wanted to at work or in everyday activities due to mental health or emotional problems?" The scale of answers is standardized to yield a mean of 50 points and around 68 percent of respondents had a value in the 40- to 60-point range.<sup>17</sup> Every two years, SOEP respondents are also asked whether they were ever diagnosed with a depressive disorder.

In the SOEP, the value for general life satisfaction is based on the question, "How satisfied are you with your life, all things considered?" The answers are ratings on a scale of zero (completely dissatisfied) to ten (completely satisfied).

and Elke Holst, "Gender Income Gap bei Führungskräften und Selbständigen" *spw* no. 209, issue 4 (2015): 37-44; Elke Holst and Anne Busch, "The Gender Pay Gap in Germany." In eds. Bruce Headey and Elke Holst, *A Quarter Century of Change: Results from the German Socio-Economic Panel (SOEP)*, (Berlin: German Institute for Economic Research, 2008): 81-86. (available online; accessed July 22, 2017)

<sup>14</sup> Marieka Klawitter, "Meta-Analysis of the Effects of Sexual Orientation on Earnings," *Industrial Relations* 54 (1) (2015): 4-32.

<sup>15</sup> Ilan H. Meyer, "Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence," *Psychology of Sexual Orientation and Gender Diversity*, 1(S) (2013): 3-26.

<sup>16</sup> Laura A. King and Nathan Grant Smith, "Gay and Straight Possible Selves: Goals, Identity, Subjective Well-Being, and Personality Development," *Journal of Personality* 72 (2004): 967-994.

<sup>17</sup> Hanfried H. Andersen et al., "Computation of Standard Values for Physical and Mental Health Scale Scores Using the SOEP Version of SF-12v2," *Schmollers Jahrbuch: Journal of Applied Social Science Studies*, vol. 127 (1) (2007).



fied). Based on the same scale, respondents also give their answers on life satisfaction in various areas of life, such as gainful employment, living situation, and family life.

In general, the SOEP data for Germany tend to confirm the international findings of lower wellbeing among LGBs (see Table 3).<sup>18</sup> In comparison to heterosexuals, LGB answers indicate somewhat lower satisfaction with life in general (a rating of 7.0 vs. 7.4). Further, gay and bisexual men report higher psychological stress than heterosexual men (not presented in the form of a table broken down by gender). LGBs also report having ever been diagnosed with a depressive disorder twice as often as heterosexuals (20 percent vs. ten percent).<sup>19</sup>

LGBs are less satisfied with their health and family life than heterosexuals—a finding in line with previously reported findings.

However, there are no differences in physical health.

### Virtually no differences in personality structure

In psychological research, a person's personality is often mapped using a five-factor structure (the "Big Five" traits), consisting of: openness, conscientiousness, extraversion, agreeableness, and emotional stability.

In the existing body of scientific studies conducted on the personalities of LGBs or heterosexuals, almost no differences emerged.<sup>20</sup>

According to the SOEP data, among men in Germany only two of the five traits show differences (Table 4). Gay and bisexual men reported being somewhat less emotionally stable than heterosexual men (3.7 vs. 4.0).

**18** In the Netherlands Kinship Panel Study (NKPS) as well, 180 respondents in same-sex relationships report lower life satisfaction than the 9,869 respondents in [different-sex] relationships. See Samantha L. Tornello, Katya Ivanova, and H.M.W. Bos, "Same-Sex and Mixed-Sex Couples in the Netherlands: The Association Between Life Satisfaction and Relationship Dynamics," *Journal of Family Issues* (2017).

**19** This difference in the prevalence ratio is almost as high for men (gay and bisexuals 13.5 percent, heterosexuals: 7.2 percent) as for women (lesbians and bisexuals: 25 percent, heterosexuals: 11.6 percent). The values reported on the basis of SOEP data for the occurrence of depressive disorders roughly correspond with the findings of the Study on the Health of Adults in Germany (*Studie zur Gesundheit Erwachsener in Deutschland*, DGES) of the Robert-Koch-Institut. There a prevalence of depressive disorders is reported for 7.8 percent of men and 15.4 percent of women. See M.A. Busch et al., "Prävalenz von depressiver Symptomatik und diagnostizierter Depression bei Erwachsenen in Deutschland", *Bundesgesundheitsblatt*, 56 (2013): 733-739.

**20** A national representative study from New Zealand found differences between homosexual and heterosexual men on two of the Big Five traits and only on one of the five traits between homosexual and heterosexual women. See Lara M. Greaves et al., "Personality across sexual identity and gender in a national probability sample in New Zealand," *Sex Roles* 1-10 (2017).

Table 3

### Health and Life Satisfaction

Average values by group

	Heterosexual		LGBs (3)	Difference (1-3)	Difference (2-3)
	For information purposes: Without age adjustment (1)	Adjusted to age structure LGBs* (2)			
Physical health (PCS)**	48.2	51.1	51.4	**	
Mental health (MCS)**	50.0	49.7	48.0	*	
Life satisfaction	7.2	7.4	7.0		*
Depressive disorder	9.5	10.5	19.6	**	**
<i>Satisfaction in different areas<sup>2</sup>:</i>					
Partnership	8.0	8.1	8.0		
Work	6.9	7.1	6.8		
Household income	6.8	6.7	6.3	*	*
Personal income	6.3	6.2	5.9	*	
Standard of living	7.5	7.5	7.2		
Family life	7.9	7.9	7.2	**	**
Health	6.5	6.9	6.4		**

<sup>1</sup> Composite indicator according to SF12. Scale is normed so that the median is 50 and around 68% of cases lie between 40 and 60.

<sup>2</sup> Scale from 0 to 10. For the wording of the question, see main text.

Significance levels: \*:  $p < 0.05$ ; \*\*:  $p < 0.01$ .

Sources: Socio-Economic Panel v33.beta; authors' own calculations.

This finding is in line with their higher perceived psychological stress. They also reported being somewhat more open to new experiences than heterosexual men and women (5.0 vs. 4.5 and 4.6). The difference in openness could also be caused by the SOEP survey procedure: men who are more open than average may have been more likely to provide information on their sexual orientation to the same sex.

With regard to the traits of conscientiousness, extraversion, and agreeableness, there was no statistical difference for men.

In addition, the study found no personality differences for women: lesbians, bisexual women, and heterosexual women all reported similar values for all of the Big Five traits.

### Political attitudes: strong support for the Green Party and the Left Party among LGBs

LGBs are somewhat more interested in politics than heterosexuals. They also reported long-term party identifi-

Table 4

**Personality**  
Averages by Group

	Men					Women				
	Heterosexual		LGBs (3)	Difference (1-3)	Difference (2-3)	Heterosexual		LGBs (3)	Difference (1-3)	Difference (2-3)
	For information purposes: Without age adjustment (1)	Adjusted to age structure LGBs (2)				For information: Without age adjustment (1)	Adjusted to age structure LGBs (2)			
<i>"Big Five"</i> :										
Openness	4.4	4.5	5.0	**	**	4.6	4.6	4.8		
Emotional stability	3.9	4.0	3.7	**	**	3.7	3.7	3.7		
Extraversion	4.8	4.8	4.8			5.0	5.0	4.9		
Agreeableness	4.8	4.8	4.8			4.7	4.8	4.7		
Conscientiousness	4.8	4.9	5.0			4.8	4.8	4.9		

1 The questions were preceded by the text: "Below are different qualities that a person can have. You will probably find that some apply to you perfectly and that some do not apply to you at all. With others, you may be somewhere in between." Then the personality traits were described: "I see myself as someone who is sometimes rude to others," "... gets nervous easily," and so on. Respondents rated their agreement with the statements on a scale from 1 to 7.

Significance levels: \* : p < 0.05; \*\* : p < 0.01.

Sources: Socio-Economic Panel v33.beta; authors' own calculations.

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cation with statistically greater frequency (68 percent vs. 56 percent). The distributions also vary, possibly due to differences in life situations and party platforms (Table 5). Significantly fewer LGBs who reported long-term party identification support the Christian Democrats (*Christlich Demokratische Union*, CDU, and *Christlich-Soziale Union in Bayern*, CSU) (21 percent vs. 35 percent of all persons with long-term party identification). However, support for the Green Party (*Bündnis90/Die Grünen*) and the Left Party (*die Linke*) is higher among LGBs than among heterosexuals (27 percent vs. 16 percent and 13 percent vs. seven percent, respectively).

**Conclusions**

The SOEP data show that, contrary to existing stereotypes, homosexual and bisexual people are no different than heterosexuals when it comes to personality. However, the two groups differ in some aspects of their life situations: LGBs pursue different professions than heterosexuals; they earn lower wages, more often live alone, and count on their relatives for support less frequently, relying more on friends. The study presented here provides only initial findings that could offer a point of departure for more in-depth analyses.

From the perspective of the social sciences and economics, it would be desirable to factor in the sexual orientation

of respondents when reporting on social issues in Germany. This is already widespread practice in the United States, for example. This could allow better documentation of life situations and help to identify areas where action is crucially needed—for instance, in fighting discrimination. The European Council already advises member states to “collect and evaluate relevant data in order to monitor and eliminate all direct or indirect discrimination due to sexual orientation or gender identity.”<sup>21</sup> In a similar vein, within the context of the “EU Roadmap against homophobia and discrimination on grounds of sexual orientation and gender identity,” EU institutions have repeatedly called upon EU member states to “regularly survey relevant comparable data on the situation of LGBTI persons in the EU.”<sup>22</sup>

Implementing these measures by supplementing the federal government’s current reporting on social issues with the traits of sexual orientation and gender identity would require an expansion of the existing empirical database for Germany. For example, it would be necessary to

21 Council of Europe, “Recommendation CM/Rec(2010)5 of the Committee of Ministers to member states on measures to combat discrimination on grounds of sexual orientation or gender identity,” (Web page, Council of Europe, Brussels, 2010). (available online, accessed July 22, 2017)

22 European Parliament, “Resolution of 4 February 2014.”



add special samples to existing nationwide longitudinal studies such as the SOEP, along with the corresponding selection and projection frameworks.

Particularly with regard to the reported wage differences, which cannot be explained by differences in qualifications, experience, sectors, or work time models, the findings presented here indicate a need for action in the political sphere to promote equality between LGBs and heterosexuals.

The low frequency of vocational training as opposed to tertiary education among LGBs and the differences in wages reported here are not enough to prove that LGBs face discrimination in the job market. However, since these differences cannot be explained by different levels of qualifications or professional experience, it is essential to find the reasons for the wage differences. To the extent that LGBs are indeed being discriminated against, not only the legal methods of countering discriminatory hiring and wage policies but also corporate culture itself must be improved to hold diversity in high regard.

Table 5

**Political attitudes**

Share in percent

	Heterosexuell		LGBs (3)	Difference (1-3)	Difference (2-3)
	For information purposes: Without age adjustment (1)	Adjusted to age structure LGBs (2)			
Political interest <sup>1</sup>			44		*
Long-term party identification <sup>2</sup>	62	56	68		**
<i>of that number<sup>3</sup>:</i>					
SPD	31	29	25		
CDU/CSU	38	35	21	**	**
FDP	3	3	3		
B90/Green Party	13	16	27	**	**
Left Party	7	7	13	*	*
Rep/DVU/NPD	1	1	3		
AfD	3	4	4		
Other	3	4	5		

<sup>1</sup> To measure political interest, respondents were asked the following question: "Generally speaking, how interested are you in politics?" The four response categories range from "very interested" to "disinterested". For the table, the two lower categories were condensed into "no" and the two upper categories into "yes".

<sup>2</sup> To measure party identification, respondents were asked the following question: "Many people in Germany lean towards one party in the long term, even if they occasionally vote for another party. Do you lean towards a particular party?"

<sup>3</sup> Percentage of respondents with party affiliation (sums to 100).

Significance levels: \*;  $p < 0.05$ ; \*\*;  $p < 0.01$ .

Sources: Socio-Economic Panel v33.beta; authors' own calculations.

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