

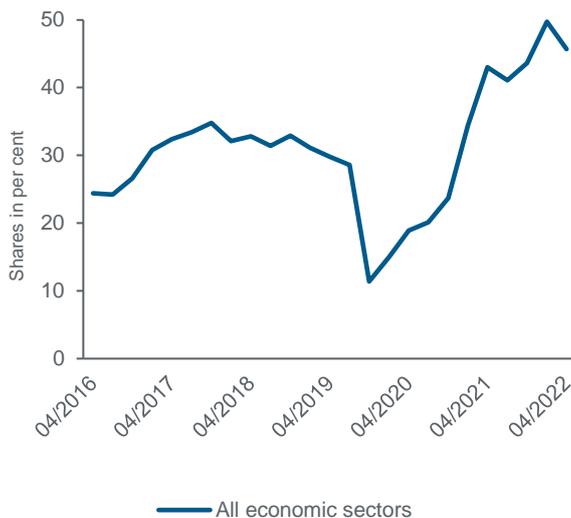
Half of German businesses are already competing for skilled workers

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- At the start of the fourth quarter, skills shortages were affecting operations at 46% of businesses. The lack of skilled labour has further increased since the previous year despite the Ukraine crisis.
- All sectors of the economy are affected, particularly the services industries, where nearly half of enterprises are hampered by skilled labour shortages.
- Job openings are now vacant for an average of five months, and recruitment times are becoming much longer.
- Labour productivity per person employed has nearly stagnated in the past five years. If this trend continues and if the employable workforce declines as a result of demographic change, a phase of permanent decline in gross domestic product could set in three to four years from now.

KfW-ifo Skilled Labour Barometer



Shares of businesses whose operations are being negatively affected by a shortage of skills. Q2/2022 means 2nd quarter 2022, with the survey conducted in the first month of each quarter, meaning October for the current quarter.

Sources: KfW Research, ifo Institute

Skills shortages worsened further in 2022, with workers in short supply in all sectors

In October 2022, 45.7% of SMEs surveyed under the KfW-ifo Skilled Labour Barometer reported that their operations were hampered by a shortage of skilled workers. In the services sector it was 48.2%, in manufacturing 42.1%. Overall, large enterprises are affected more often than small and medium-sized businesses (48.9 vs. 44.1%). It is true that demand for skilled labour and workforce shortages have decreased slightly on the third quarter as a result of the cyclical downturn and grim expectations of businesses. But the shortage of skilled labour worsened once again in 2022 on the previous

KfW-ifo Skilled Labour Barometer – Economic Sectors



year despite the ongoing Ukraine crisis.

All sectors were more or less affected by skills shortages. Those hit particularly hard include law firms, tax accountancies and auditing firms, 68% of which saw their business impaired by a shortage of skilled labour. More than 50% of architecture and engineering firms as well as transport and telecommunications companies, catering and hospitality businesses, information service providers and manufacturers of data processing devices, electronic and optical equipment were impacted.

The least affected sectors were chemicals, paper and cardboard manufacturers, where just under 20% of businesses each saw their operations hampered by a shortage of skilled workers. That was because the earnings situation in these industries has worsened significantly. In domestic manufacturing, production was reduced as a result of decreasing demand and high costs of materials and energy. Paper and cardboard manufacturers also cut back their production because their earnings came under pressure from high cost increases for raw materials, energy and logistics.

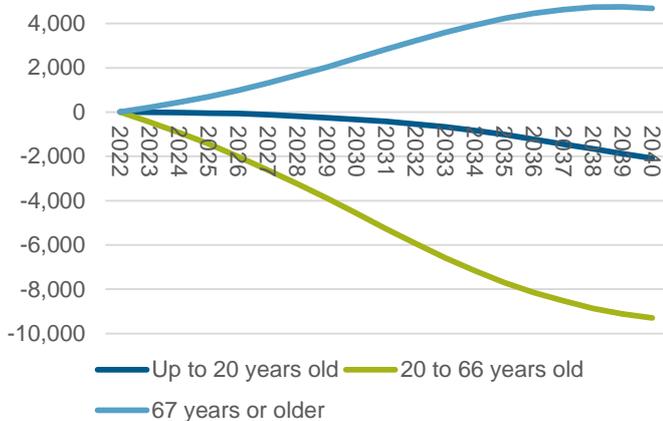
The challenge: demographic structural change of historic dimensions

In a zero net immigration scenario, the number of working-age population aged 20 to 66 would decrease by 9.3 million people, or 18%, and the number of retirement-age people would increase by 4.7 million, or 28%, by the year 2040. But the population under the age of 20 is also estimated to fall by around 2 million even without net immigration if the current birthrate remains unchanged.

In the next three years, the domestic workforce will decrease by a further 1.5 million people, the number of pensioners will grow by around 700,000 and the number of children and youths will drop only minimally for the time being. Therefore, unless effective action is taken without delay, the skilled labour shortage will increase further.

Number of people of working age will shrink by 9 million, pensioners will grow by 5 million

Cumulative change in number of inhabitants in Germany by age class in 1,000 per year assuming net zero immigration under the Federal Statistical Office's G2L2W0 scenario



Source: German Federal Statistical Office, own calculations and presentation

Reducing the growing skills shortage requires a broad mix of measures

If Germany's prosperity is to be secured and continue growing, the impact of this development on per-capita GDP must be offset through:

- greater labour force participation and longer working hours, which are still to be expected for women, older workers, minimally employed and unemployed workers,
- immigration and
- higher labour productivity growth, which will reduce the need for skilled workers in areas of shortage.

Demographic change is so vast that all these levers have to be pulled simultaneously in order to safeguard prosperity and prosperity growth while successfully rising up to the remaining great challenges, especially climate change action, the mobility transition, digitalisation, safeguarding international value chains and raw material supplies, growing financial burdens on social protection systems, higher defence expenditure and debt reduction.

Monitoring the impacts on the overall economy and key influencing factors of the skills shortage

Monitoring to assess the need for action

In October the German Federal Government adopted a new skilled labour strategy. Its aim is to help reduce the skills shortage. In order to continuously assess developments and identify any need for action at an early stage, macro-economic monitoring is necessary. The present Skilled Labour Barometer has come to include indicators that are suitable for macroeconomic monitoring. They provide information about how the shortage and supply of, and demand for, skilled workers as well as important influencing factors have developed. Gross domestic product per inhabitant and its determinants have been established as a key measure of economic well-being and the strength of the German economy. Other factors include labour market participation, immigration and the development of labour productivity.

Crises have caused low economic growth but it faltered even before the coronavirus crisis

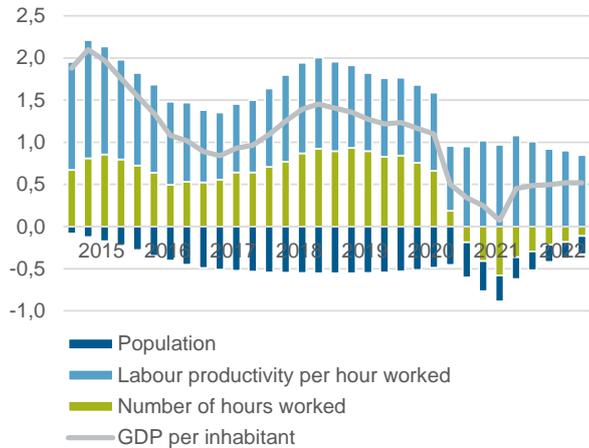
In the past five years, gross domestic product per inhabitant grew by a mere 0.5% per quarter on average (year on year). This was due to the sharp drop in hours worked as a result of the coronavirus crisis. But per-capita growth already weakened before that. This weakening was diagnosed as a temporary cyclical weakness but the phase of reduced per-capita growth has now been ongoing for the past seven years. The demographic trend has also acted as a dampener, as shown by the growing number of businesses hampered by skills shortages and much extended job vacancy periods.

Recession expectations have only slightly dampened labour demand so far

The German economy is teetering on the brink of recession. Nevertheless, many businesses are still hiring. In November, 823,000 job vacancies were reported to the Federal Employment Agency, much more than before the beginning of the coronavirus crisis. If the economic recovery resumes from the spring of next year, demand for skilled workers will increase more strongly again. According to estimates made by the Institute for Employment Research (IAB) on the basis of the IAB Establishment Panel, the total number of job vacancies (including those not reported to the Federal Employment Agency) stood at 1.8 million in the third quarter of 2022, after a record high 1.9 million in the second quarter.

Per-capita growth was pointing downward already before the crisis

Rates of variation on the previous year's quarter, geometric mean of the past five years (20 quarters)

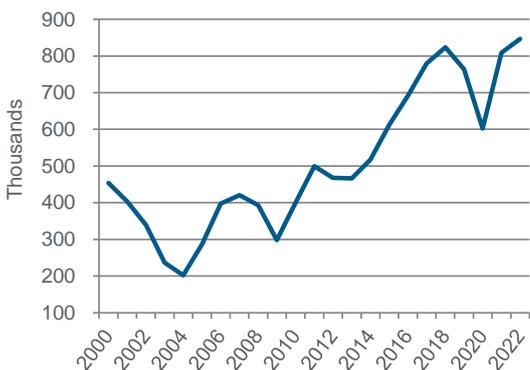


Guide: Where the graph shows GDP growth per inhabitant of 0.5% in the last quarter, for example, that is the mean (geometric mean) of the variation rates of the past 20 quarters (always on the previous year's quarter). The same applies to the other variables.

Source: Federal Employment Agency, own illustration

Number of job vacancies climbed to a new record in October

Number of vacancies reported to the Federal Employment Agency in thousands



Source: Federal Employment Agency, own illustration

Recruitment times for open positions have increased steeply

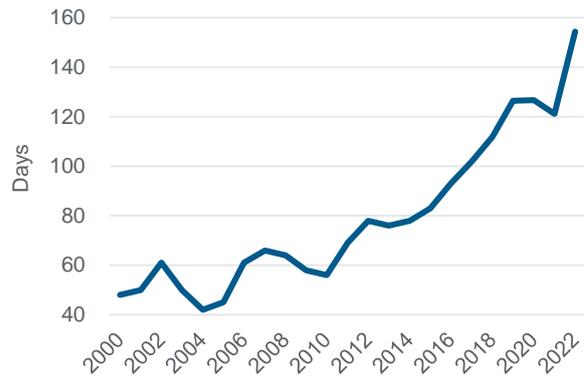
In October it took 154 days on average to fill a job vacancy reported to the Federal Employment Agency, meaning it took around five months to staff an open position. Job vacancy periods increased steeply in 2022 from four months in 2021 and two months in 2010.

Half of the unemployed are not sufficiently qualified for almost 80% of registered job vacancies

Fifty-two per cent of unemployed people are unskilled workers. However, 57% of job vacancies are advertised for formally trained skilled personnel and 20% for specialists or experts with higher-level occupational or academic qualifications. There are only 184,000 reported job openings for unskilled workers for 1.3 million unemployed people. Even if we add 60% unreported job openings, there are far too few job openings for unskilled workers.

Filling vacancies is taking increasingly longer

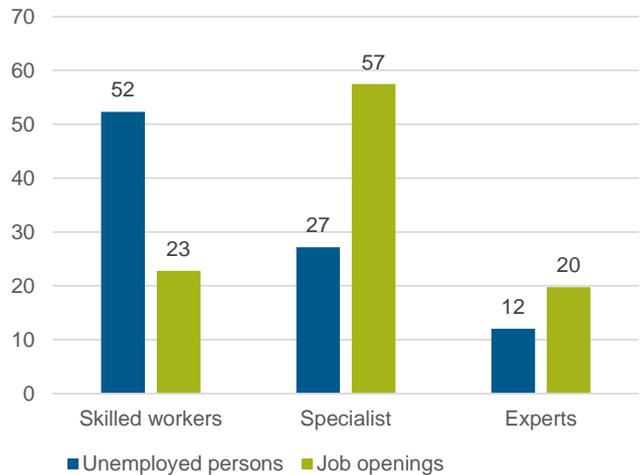
Average completed vacancy periods for reported open positions in days, as at October



Source: Federal Employment Agency, own illustration

Major mismatch between qualifications of unemployed persons and job requirements

Unemployed persons and job openings by skill level, shares in per cent



For 9% of unemployed persons there are no details on skill levels. Here, skilled workers means workers with in-company vocational training as defined by the German Classification of Occupations (KldB) 2010. Specialists are employees with higher-level skills (master, technician, bachelor, upper-middle-level civil servants), experts are university graduates of degree courses with at least four years of study as well as upper-level civil servants.

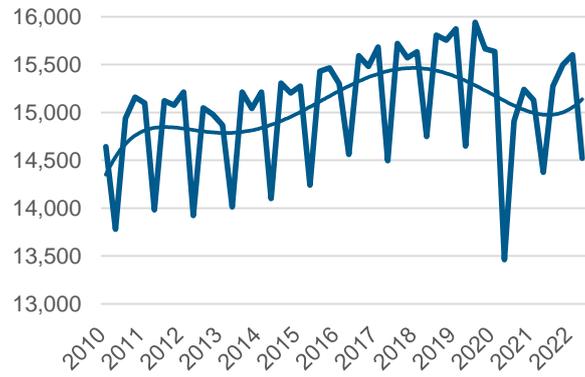
Source: Federal Employment Agency, own calculations and presentation

Employees are increasingly working fewer hours, working hours across the economy have fallen

Up until the coronavirus crisis, the total number of hours worked was still trending upward. Behind this are two opposing trends. While the number of hours worked per worker have been on a downward trend for decades, the overall workforce has grown steadily. In the second quarter of 2022, the workforce stood at 45.5 million workers, which was already 240,000 more than in the second quarter of 2019.

The total number of hours worked across the economy fell as a result of the coronavirus crisis

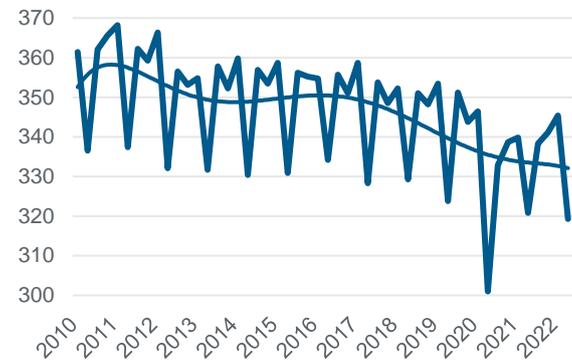
Hours worked in millions



Source: Federal Statistical Office, own rendition

The number of hours worked per worker is on the decline

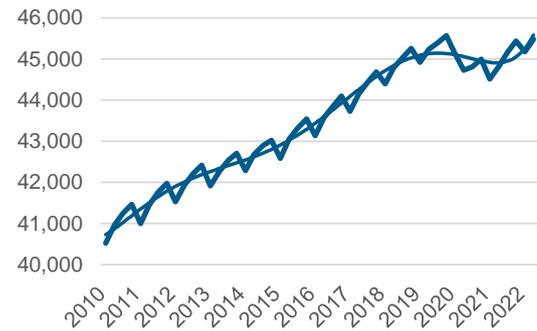
Number of hours worked per worker per quarter



Source: Federal Statistical Office, own rendition

The workforce has resumed the growth trend that preceded the coronavirus crisis

Workforce in thousands, quarterly data



Source: Federal Statistical Office, own rendition.

Women and migrants combined drove most of the growth in employment

In the first four months of the year 2022, women accounted for 46% and migrants for 56% of the growth in employment subject to social security contributions.¹ Before the coronavirus crisis, women still accounted for the greatest portion of employment growth. The reduced contribution of women to employment growth may be due to the fact that the vast majority of personal services employees are women. High rates of worker absence in these occupations and fear of

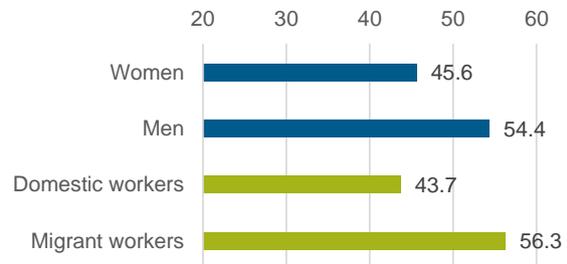
infection are likely to have prompted women in particular to abandon their work or refrain from seeking employment.

In general, the contribution of women to employment growth is subject to fluctuations for which different explanations are possible. Thus, in 2018 women accounted for only 42% of the growth in the number of employees subject to social security contributions. Such fluctuations may also be associated with the gender composition of migrant workers. The causes can also change over time.

The number of women in employment subject to social security contributions increased significantly by 300,000 until September 2022 on the same period in the previous year despite their lower contribution to employment growth. Women thus made a valuable contribution to increasing the supply of labour in that year as well.

Migrant workers dominate employment growth

Share in employment growth during the period from January to April 2022 on the same period in the previous year in per cent.



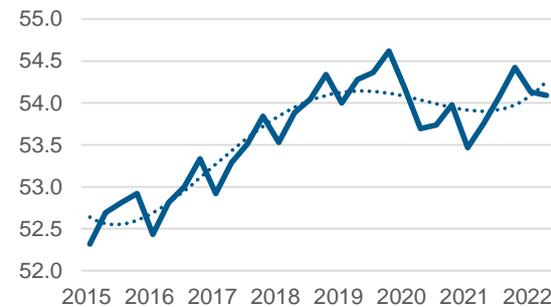
Source: Federal Employment Agency, own illustration

Employment rate is below pre-crisis level

Labour market participation continued to increase in the first half of 2022 on the previous year. However, in the second quarter of 2022 the employment rate (share of economically active persons in the population) stood at 54.1%, which was below the historic high of 54.6% recorded in the fourth quarter of 2019. The employment rate can be expected to drop in the long term as a result of the ageing of the population.

The coronavirus crisis has interrupted the long-term growth in the employment rate.

Employment rate (share of economically active persons in the population) in per cent



Source: Federal Statistical Office, own rendition

Immigration on record level as a result of Ukraine war – but integrating refugees into the labour market takes time

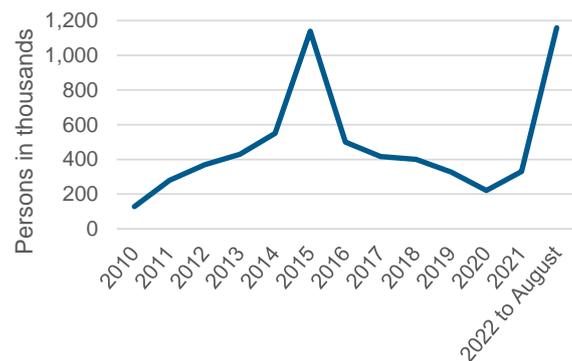
From January to August, a net 1.2 million people migrated to Germany. However, immigration has already dropped

significantly again. In August a net 83,000 people migrated to Germany compared with 479,000 in March.

As these are mainly refugees, their labour force participation is initially low. This highlights the fact that the data on how much immigration is necessary to ease the skills shortage in Germany requires interpretation. It depends on a range of variables including qualifications and possibilities for integrating migrants into the labour market, the employment rate of the resident population, the development of labour productivity and the level of prosperity and economic growth aspired to for Germany.

Migration reached record level in 2022

Net immigration for Germany in 1,000 persons



Source: German Federal Statistical Office, own calculations and presentation

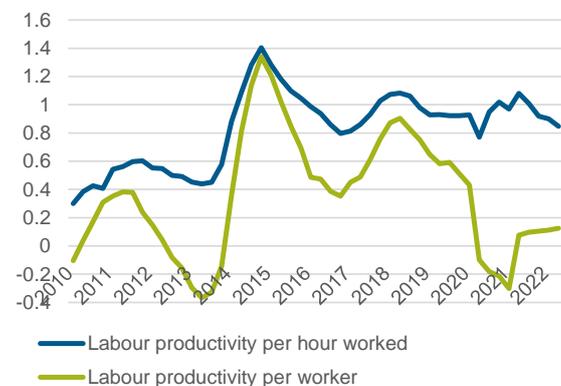
Worker productivity is hardly increasing anymore because of declining working hours

Despite the economic crisis, productivity per hour worked still increased by 0.8% per quarter (year on year) on average over the last five years. That enabled businesses to stabilise the growth of labour productivity per hour worked on an elevated level through innovation and investment.

Labour productivity per worker, on the other hand, almost stagnated during the same period. That means the growth of labour productivity has still not recovered from the coronavirus crisis.

Worker productivity grew at a significantly lower rate than hourly productivity as a result of decreasing working hours

Rates of variation on the previous year's quarter, geometric mean of the past five years (20 quarters)



Guide: Where the graph shows labour productivity growth of 0.1% in the last quarter, for example, that is the mean (geometric mean) of the variation rates of the past 20 quarters (always on the previous year's quarter).

Source: German Federal Statistical Office, own calculations and presentation

Conclusion – the most important findings

- The KfW-ifo Skilled Labour Barometer shows that skills shortages have continued to grow in 2022. Half of all businesses are affected.
- In the past five years the German economy grew by only 0.5% per inhabitant per quarter on average. Per-capita growth fell already before the coronavirus crisis. Some of this was cyclically induced, but the increasing production disruptions from a lack of skilled workers allow the conclusion that skilled labour shortages have been a contributing factor.
- In October it took five months on average to fill reported job vacancies and the trend is rising.ⁱⁱ
- Unemployed people were able to contribute to filling vacancies to a limited extent only, as half of them are unskilled and 80% of reported openings would require them to undergo vocational training first. There are 1.3 million unemployed unskilled workers but only 184,000 reported unskilled job vacancies.
- The total number of hours worked across the economy grew again in 2022 but it is lower than before the coronavirus crisis because workers individually are working fewer hours.
- Women and skilled migrants play an important role in further increasing the employment rate. In 2022, almost half of the growth in employment was driven by women and 56% by workers with a migrant background.ⁱⁱⁱ
- As a result of the Ukraine war, net immigration in 2022 stood at 1.2 million people up until August. Without language instruction, further training and recognition of existing skills, however, only a small portion of refugees can work in skilled positions in Germany.
- As a result of decreasing hours worked, labour productivity per worker almost stagnated in the past five years. If worker productivity growth remains weak and the demographically induced decline in employment continues, gross domestic product may shrink in real terms in future. Unless adequate countermeasures are taken, this trend could set in three to four years from now. The impact would be roughly as if Germany were in a permanent recession. The only difference is that skilled workers would become increasingly scarce.

In the study [Deutschland muss produktiver werden, um die künftigen Herausforderungen zu meistern](#) (*Germany must become more productive to meet the challenges of the future* – in German only), KfW Research analysed the demographic challenge in greater detail and indicated options for combating the shortage of skilled labour.

KfW-ifo Skilled Labour Barometer in figures

Shares of businesses whose operations are being negatively affected by a shortage of skills.

		Quarter / Year		
		04/2021	01/2022	02/2022
Total		43.0	49.7	45.7
Manufacturing	Total	36.6	44.5	42.1
	Manufacturing vehicles & parts	36.0	30.5	35.9
	Mechanical engineering	33.5	43.0	47.4
	Manufacturing food & animal feed	32.3	58.1	47.6
	Manufacturing chemical products	20.1	24.1	19.6
	Manufacturing metal products	45.8	57.0	50.1
	Metal production & processing	38.1	42.0	45.2
Construction	Total	35.3	39.3	37.0
Trade	Total	33.0	38.7	37.6
	Wholesale	30.0	36.3	35.4
	Retail	37.0	41.9	40.6
Services	Total	47.8	54.2	48.2
	Transport: overland / pipelines	64.0	56.1	54.4
	Telecommunication	25.3	43.5	56.8
	Provision information services	53.0	61.7	53.7
	Legal & tax consultation	52.2	72.0	68.1
	Business consultation	34.3	43.9	32.4
	Arch./eng. firms, Tech./phy./chem. te	54.1	60.2	58.4
	Research & development	37.0	51.9	50.7
	Catering	48.9	52.5	48.2
	Accommodation	72.1	64.7	54.1
SME		43.2	48.5	44.1
LSE		42.5	52.2	48.9

Source: KfW Research, ifo Institute

Abbreviations:

S(mall and) M(edium-sized) E(nterprises). L(arge-)Scale E(nterprises).

Construction and interpretation of the KfW-ifo Skilled Labour Barometer

The KfW-ifo Skilled Labour Barometer is based evaluations of the ifo economic surveys which are used to calculate, among other things, the well-known ifo Business Climate Index. The Skilled Labour Barometer reports on the share of enterprises in Germany that report adverse impacts on business operations from a shortage of skilled workers. Each quarter about 9,000 enterprises from trade and industry, construction, wholesale, retail and services (without the banking and insurance sectors or the state) are polled on their business situation, among them some 7,500 SMEs. In addition to providing an overall indicator for the skills shortage in the German economy and indicators for various sectors and regions, the barometer also enables a company size-specific data evaluation separated into SMEs and large enterprises. Enterprises are generally classed as small to medium-sized if they employ a workforce of not more than 500 and record an annual turnover not exceeding EUR 50 million. For a more accurate analysis, however, these quantitative distinctions have to be drawn more narrowly for retail trade (maximum annual turnover of EUR 12.5 million), the building and the construction industry (up to 200 employees) and services (maximum annual turnover of EUR 25 million). All enterprises that exceed at least one of these thresholds are classed as large-scale enterprises. The construction and civil engineering sector was first surveyed on the impacts of skills shortages on business activity in the third quarter of 2018. That was the reason the sector was not integrated into the overall indicator before that quarter. The value of the overall indicator varies only marginally as a result.

ⁱ At the time of preparation of this paper, data on foreign workers was available only up to the month of April. Gender-disaggregated data was available up to September, however. The share of women in employment growth in 2022 also stood at 46% up to September. This also matches the share of women in all employees subject to social security contributions.

ⁱⁱ The completed vacancy duration in a particular month is distinct from the vacancy duration for all job openings reported in that month. The completed vacancy duration refers only to openings deregistered in that month because they were either filled or because employers no longer sought to fill them.

ⁱⁱⁱ The 56% include women who hold non-German citizenship. Thus, there is an overlap with the female share reported.