GERMANY’S LABOUR SHORTAGE: BETWEEN STRUCTURAL PRESSURE AND UNCERTAIN HORIZONS

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Abstract: Germany is currently facing a profound labour shortage that transcends sectoral boundaries and reflects deeper demographic and structural transformations. Following a brief post-pandemic rebound, the German economy has entered a phase of stagnation and mild contraction, further intensifying labour market pressures. Persistent shortages, particularly in skilled occupations, point to long-standing imbalances and systemic constraints. This article examines the structural drivers of these imbalances, focusing on demographic ageing, sectoral disparities, and the enduring weaknesses of Germany’s education, vocational training, and labour migration systems. Drawing on recent statistical and institutional data and policy developments, the analysis shows that, despite being targeted, existing measures remain insufficient in both scope and coherence. Structural rigidities and demographic inertia continue to hinder the country’s ability to adjust to long-term labour market shifts. These findings suggest that a more integrated and forward-looking reconfiguration of Germany’s labour model is needed to ensure long-term economic resilience and demographic sustainability.

Keywords: German labour market, workforce shortages, demographic change, skills mismatches, vocational training, structural constraints, policy responses

JEL Classification: J11, J21, J23, J24

1. Introduction

For sometime now, Germany’s labour market is experiencing a period of significant imbalance, influenced by the convergence of long-term demographic shifts and ongoing structural rigidities. While labour shortages are not a new phenomenon, their recent intensification in terms of both scope and persistence has brought the issue to the forefront of economic, academic and policy debates. What was once considered a cyclical or sector-specific concern has evolved into a challenge that cuts across sectors and has systemic implications.

Over the years, the German economy has been experiencing a slow and uneven recovery following the combined impact of the pandemic, geopolitical disruptions and macroeconomic volatility. Against this backdrop, labour market pressures have intensified, revealing a significant mismatch between labour supply and the evolving demands of employers. These tensions are particularly evident in skilled occupations, where recruitment difficulties persist despite sustained job vacancies and increasing wage incentives.

While numerous studies have explored individual aspects of this phenomenon, such as demographic ageing, vocational training bottlenecks, and integration barriers, the overall picture remains fragmented. This paper aims to provide a more comprehensive analysis by examining how demographic inertia, sectoral asymmetries, and institutional dynamics interact to create sustained labour market tension.

The paper is structured as follows: Section 2 provides an overview of the literature on labour shortages; Section 3 outlines the methodology; Section 4 analyses the demographic and structural drivers of labour market pressure; Section 5 evaluates recent policy responses; and Section 6 concludes with a summary of the main findings.

2. Literature review

A growing body of research has examined the complex interplay between demographic change, labour market dynamics and institutional responses in Germany. Robust longitudinal data from the Federal Statistical Office (Destatis[1]) and Eurostat reveal persistent trends in population ageing, declining fertility and rising old-age dependency ratios, which constrain the labour supply in the long term. Gans (2018) and Nowossadeck et al. (2019) delve deeper into these structural pressures, highlighting their cumulative demographic impact on the working-age population and its implications for welfare sustainability.

In terms of the labour market, the Institute for Employment Research (IAB[2]) has developed nuanced indicators to monitor recruitment bottlenecks, sectoral disparities and the evolving mismatch between supply and demand. The concept of "labour market tightness", analysed by Bossler and Popp (2023a), provides a valuable means of capturing the uneven regional and occupational distribution of these shortages. Their research suggests that structural constraints, rather than cyclical fluctuations, are driving the observed imbalances.

Vocational education and training (VET) have been identified as vital tools for enhancing workforce adaptability. However, studies by Cedefop[3] (2020, 2023) and the Federal Institute for Vocational Education and Training (BIBB[4], 2023)) reveal ongoing discrepancies between training provision, labour market requirements, and the aspirations of younger cohorts. Langen and Dörsam (2025) echo these findings in their examination of the correlation between remuneration patterns and unfilled apprenticeships, highlighting structural disincentives in the system.

Policy responses have tended to alternate between activation strategies and support mechanisms. While federal initiatives such as WeGebAU and the Social Labour Market aim to promote inclusive employment, several evaluations, including those by Bernhard and Senghaas (2021) and the IAB-FORUM (2025d), highlight the limited coherence, scalability and foresight of these measures. The OECD (2024, 2025) provides a broader macroeconomic perspective by contextualising Germany's labour shortages within global megatrends and productivity shifts.

Taken together, these contributions offer a comprehensive and multi-layered picture of the structural vulnerabilities shaping Germany's labour market. This study builds on this body of work by combining statistical evidence with institutional insights to explore how demographic rigidity, sectoral imbalances, and vocational system inertia jointly influence labour shortages in the German context.

3. Methodology

This paper employs a mixed-methods approach, integrating quantitative demographic and labour market data with a structurally informed analysis of institutional dynamics and policy responses. By combining statistical evidence with interpretative depth, the research aims to diagnose not only observable labour market trends and their underlying demographic and structural foundations.

[1] For reasons of clarity and consistency, the Federal Statistical Office of Germany will hereinafter be referred to as "Destatis".
[2] Similarly, the Institute for Employment Research (*Institut für Arbeitsmarkt- und Berufsforschung*) will often be referred to as IAB in what follows.
[3] The acronymstands for the full name of the institution:European Centre for Development of Vocational Training.
[4] The acronym BIBB derives from the German title *Bundesinstitut für Berufsbildung*, which is a central body responsible for research, policy development, and monitoring in the field of vocational education in Germany.

The quantitative dimension is based on official data from the German Federal Statistical Office (Destatis), Eurostat, the OECD, the Federal Employment Agency (BA[5]), and the Institute for Employment Research (IAB). Key indicators include the total fertility rate, life expectancy for the 65+ age group, old-age dependency ratios (OADRs), unfilled job vacancies, as well as sectoral disparities in employment.

Two complementary indicators of labour market tightness are used to assess the evolving relationship between labour supply and demand: *Tightness A*, based on registered jobseekers and reported vacancies, and *Tightness B*, which focuses on officially unemployed individuals and the same demand-side measure. Both indicators are constructed using data from June each year, in line with statistical conventions established by the BA and IAB. This mid-year reference point provides a consistent, seasonally neutral overview and ensures comparability over time.

While demographic series are presented over extended timeframes to highlight long-term structural pressures, the core analysis of labour market indicators focuses on the periodfrom 2011 to 2024. This choice reflects both data availability and the need for internal consistency across sources, particularly for indicators such as the IAB Labour Market Barometer, which was introduced in 2011.

Together, these methodological choices enable a longitudinal and multi-scalar analysis of Germany's labour shortage challenge, accounting for national dynamics as well as territorial and sectoral asymmetries that shape recruitment conditions across the country.

The analysis of these trends serves more than a descriptive purpose. It offers insight into the structural causes of Germany's current labour shortage – observed particularly in the domain of skilled work – and brings into focus the demographic imbalances that have progressively reshaped the country's workforce. This diagnostic perspective also supports the qualitative analysis of federal policy responses undertaken in the second part of the paper. Rather than evaluating isolated outcomes, the focus lies on the coherence, scope and structural alignment of recent measures, assessed considering the systemic imbalances identified in the first part.

4. Mapping the German labour shortage: from demographic shifts to sectoral and skillsmismatches

4.1 Demographic pressures and structural change in the German workforce

To fully understand Germany's current labour shortages, it is first necessary to examine the demographic forces that have reshaped the country's population structure in recent decades.

Since the beginning of the current millennium, Germany has been undergoing a deep demographic transformation, driven by a persistent decline in fertility and rising life expectancy. This dual shift has accelerated the ageing process and widened the generational gap, pushing the country into a demographic trap that exerts growing pressure on the labour market and, more broadly, on its economic and social systems.

To understand the roots of this transformation, it is necessary to trace back its historical origins. The demographic imbalances observed in recent decades are not the result of sudden shocks, but rather the consequence of long-term trends that began unfolding more than half a century ago.

By the late 1960s, the post-war period of economic expansion (known as "the German economic miracle"), which had supported relatively elevated birth rates during the 1950s and early 1960s, came to an end. At the same time, a gradual shift in collective mentality began, characterised by growing individualism, emancipation and increased personal autonomy (Gans, 2018). Life priorities were increasingly shifting away from traditional values centred on family and reproduction. Germany's birth rate subsequently entered a period of marked decline, particularly during the 1970s and 1980s. Since

[5] To ensure readability, the German Federal Employment Agency will henceforth be abbreviated as BA, the established acronym derived from its original German name (*Bundesagentur für Arbeit)*.

the early 2000s, fertility rates have stabilised at a low level, with minor fluctuations, including a modest rise between 2010 and 2016, a slight decline thereafter, and a brief uptick during the COVID-19 pandemic. Despite these oscillations, the total fertility rate (TFR) has consistently remained below replacement level[6], contributing significantly to the country's long-term demographic imbalance (Box 1, Figure 1).

This persistent demographic asymmetry, however, is not solely the result of declining fertility. It has been compounded by steady gains in life expectancy among the 65+ individuals, a trend that has reinforced population ageing, increased the old-age dependency ratio, and added mounting pressure on the structure and sustainability of the labour market. These dynamics are illustrated in greater detail in Figure 2 (Box 1).

Reflecting improvements in health, medical care, living standards, and preventive medicine, as well as growing public awareness regarding healthy ageing (Nowossadeck, von der Lippe, & Lampert, 2019), life expectancy for the 65+ age group has steadily increased in Germany over the past four decades, slowing temporarily during the COVID-19 pandemic before rising again in 2023 (Box 1, Figure 2). Evolving alongside persistently low fertility rates, this upward trend has accelerated population ageing, increased the old-age dependency ratio and reshaped the demographic composition of the workforce.

Box 1: Germany's demographic transition: shifting patterns of fertility and longevity, 1970-2023[1]

Figure 1: Trends in the total fertility rate[2], 1970-2023

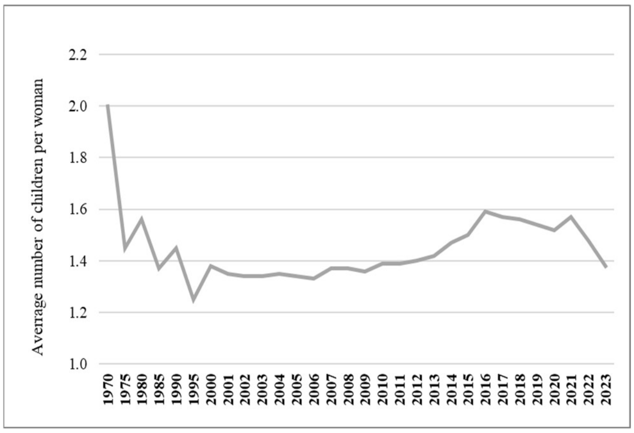
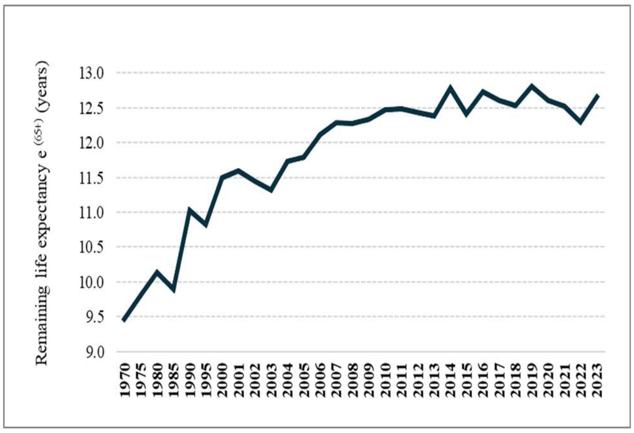


Figure 2: Average life expectancy at ages 65 and over[3], 1970-2023



Notes: [1]2023 is the latest year for which statistical data are available in the Destatis and Eurostat databases; [2]TFR represents the average number of children a woman would have over her lifetime, based on current age-specific fertility rates (according to UN/Eurostat/WB definitions); [3]Life expectancy at age 65+ ($e^{(65+)}$) represents the average number of additional years individuals in this age group are statistically projected to live, based on current mortality rates. Calculated specifically for this analysis, in line with international standards, this indicator highlights population ageing and rising old-age dependency. Source: The author's calculations and graphical representations based on data provided by Destatis (2025) [*code:12612-0009*] and Eurostat (2025) [*https://doi.org/10.2908/DEMO_MLEXPEC*].

As younger age groups become progressively less represented in the overall population, the proportion of older individuals continues to rise, a structural change that is increasingly placing visible strain on labour supply, social protection systems, and long-term care services. While these gains in longevity represent a major societal achievement, they have also triggered a profound transformation in

[6] Replacement-level fertility is defined as the average number of children a woman would need to have for a population to replace itself from one generation to the next in the absence of migration. In developed countries, this level is usually around 2.1 children per woman, accounting for child mortality and other demographic factors(Galan, 2025).

the country's demographic profile, gradually inverting the base-to-peak proportions of the age pyramid and exacerbating the intergenerational imbalance.

The following box illustrates these shifts, presenting both the evolving age structure of the German population (Figure 3) and the long-term trajectory of the old-age dependency ratio (Figure 4).

Box 2: Changing age structures and the rise of intergenerational pressure in Germany

Figure 3: Demographic profile: age and gender distribution in 2024 vs. the 2000s average

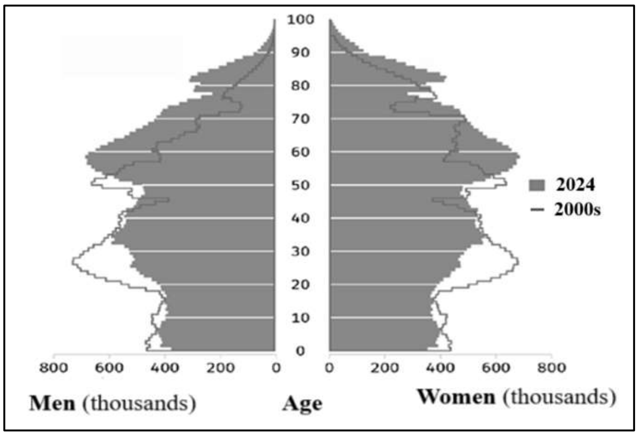
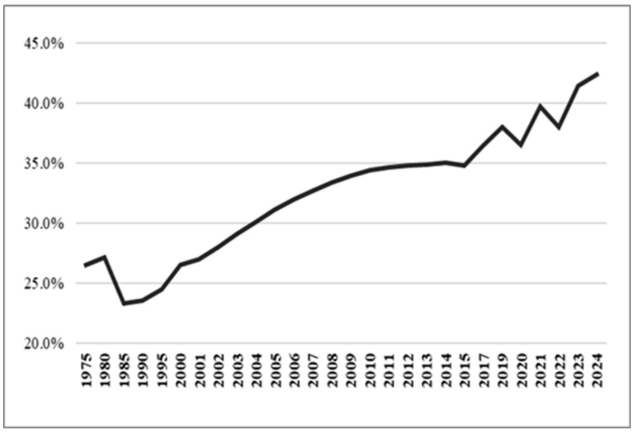


Figure 4: Structural dynamics of the old-age dependency ratio*, 1970-2023



Note: *OADR refers to the number of people aged 65 and over for every 100 individuals of working age (defined by the OECD as those between 20 and 64 years old) (OECD, 2025).
Source: The author's graphical representation based on data provided by Destatis (2025) [*Age structure of the population in Germany*] and OECD Data Archive (2025) [*Old-age dependency ratio*].

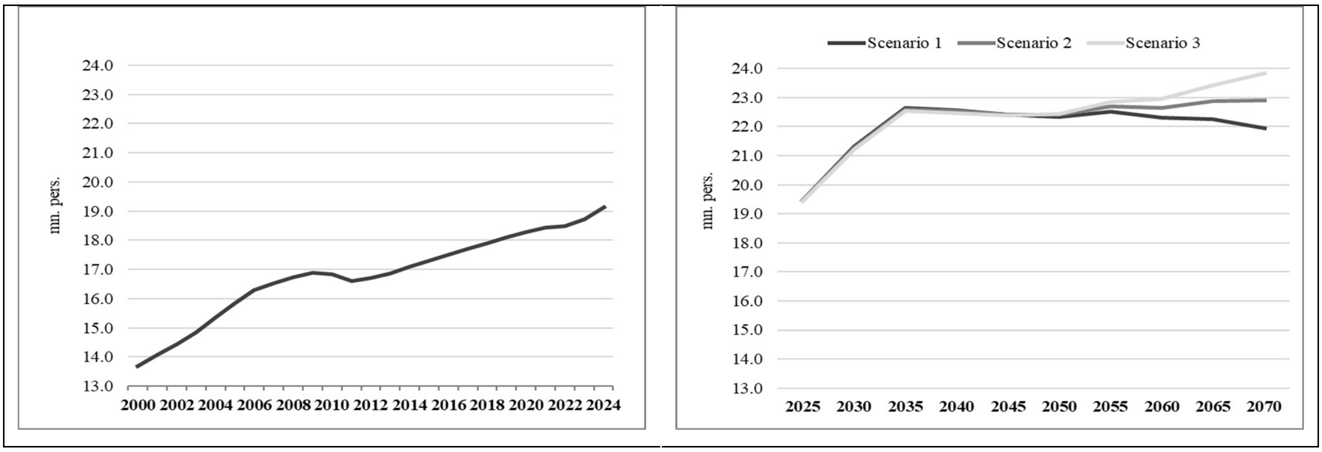
The OADR in Germany has followed a markedly upward trajectory since the mid-1980s, with a notable acceleration beginning in the early 2000s. In 2024, it reached an all-time high, emphasising the growing demographic burden on the working-age population. At present, this burden translates into a dependency ratio of 42.2%, meaning that for every 100 individuals of working age, there are over 42 persons aged 65 and above, a demographic configuration that implies just over two active contributors for each retiree (Destatis, 2025a).This structural change is quietly transforming the intergenerational dynamic, with a shrinking pool of contributors expected to meet the rising demand for pensions, healthcare, and long-term care services.

While the evolving shape of Germany's age pyramid reveals the increasing weight of older cohorts within the population, the numerical growth of the 65+ age group provides further evidence of the scale and persistence of this demographic shift. At the same time, the narrowing base of the pyramid reflects a steady decline in the size of younger cohorts, a trend which exacerbates the demographic imbalance by weakening the potential for future labour force replacement.

Furthermore, Box 3 presents both historical trends and long-term projections for this age group, emphasising the extent to which ageing has become an integral structural feature of Germany's demographic outlook.

Box 3: Germany's 65+ population: trends and projections, 2000-2070

Figure 5: Population aged 65 and over: historical trend, 2000-2024	**Figure 6: Projected population aged 65 and over: comparative scenarios, 2025-2070**



Note: The three alternative scenarios illustrated in Fig. 3 are based on different assumptions regarding fertility, life expectancy, and net migration. These are: Scenario 1 – moderate birth rate and life expectancy, with low net migration; Scenario 2 – moderate birth rate, life expectancy and net migration; Scenario 3 – moderate birth rate and life expectancy, with high migration.
Source: The author's calculations and graphical representations based on data provided by Destatis (2025) [*code:12411-0005; code: 12421-0002*].

As Figure 5 shows (Box 3), the number of individuals aged 65 and over has increased steadily over the past two and a half decades, with only minor fluctuations following the global financial crisis. Currently, the median age exceeds 45, with over 20% of the national population aged above 65. Nevertheless, the overall age structure has undergone a modest rejuvenation in recent years, driven by sustained positive net migration[7] and an upward – albeit irregular – rise in birth rates. However, these trends have not been sufficient to counteract the broader ageing dynamic. Despite this partial demographic offset, a birth deficit persists, and the combined effect of these positive impulses has yet to produce a tangible recalibration of Germany's population structure.

According to the latest projections by Destatis, the size of this age group is expected to remain significant throughout the coming decades, albeit with slight variations depending on assumptions about fertility rates, life expectancy, and net migration (Figure 6).

All three official projection scenarios indicate that the 65+ population will remain high in the long term. The low-migration scenario – generally considered the most conservative[8] – forecasts a gradual decline after 2040, while the medium- and high-migration scenarios suggest either stabilisation or continued growth until 2070. Taken together, these trajectories reinforce the notion that population ageing in Germany is not a transient phenomenon, but a deeply rooted structural transformation. This long-term demographic pressure will be further intensified by the gradual retirement of Germany's post-war baby boom generation, born between 1955 and 1969(Quitzau, 2023). Their withdrawal from the labour market is expected to be completed by 2036, resulting in the simultaneous loss of a large cohort of experienced workers and a significant shift in the country's fiscal balance, as many former taxpayers become recipients of state benefits.

4.2 Tracing labour market imbalances: from general tensions to sectoral gaps

To capture the structural challenges currently facing the German labour market more precisely, Box 4 juxtaposes two complementary indicators: the quantitative evolution of labour demand, as

[7] Since 2010, immigration has consistently exceeded emigration, with the demographic surplus concentrated among younger, economically active individuals.
[8] The low migration scenario is considered the most pessimistic because of its underlying assumptions, which imply a broader demographic contraction, including low inward migration, persistently low fertility and a shrinking working-age population. Although it projects a slight reduction in the elderly population after 2055, it simultaneously suggests an increase in dependency ratios and heightened pressure on social systems.

reflected in the number of job vacancies (presented in registered and estimated forms[9]), and the qualitative expectations surrounding its fulfilment, as captured by the IAB Labour Market Barometer[10]. While vacancy figures illustrate the upward trajectory of demand, the barometer conveys the degree of institutional confidence in the labour market's ability to respond to it. Taken together, these indicators provide a clearer understanding of the growing discrepancy between rising labour needs and the perceived capacity to meet them, a pattern that is becoming increasingly indicative of structural imbalance.

Figure 7 therefore presents both officially registered vacancies (as reported by the Federal Employment Agency/BA) and total open positions, including those not reported to public employment services. The latter are estimated by the IAB Job Vacancy Survey, a quarterly, establishment-level instrument that provides a broader perspective on labour demand than administrative data(Institute for Employment Research/IAB, 2025b,c). This methodology enables a more accurate assessment of unmet labour demand across sectors and firm sizes.

As shown in Box 4, the total number of job vacancies in Germany almost doubled between 2011 and 2024, reaching an all-time high in 2022. In contrast, the IAB Labour Market Barometer – which reflects employment agencies' expectations regarding the likelihood of filling these positions – followed a downward trajectory over the same period, with only short-lived recoveries followed by renewed declines. This growing discrepancy between the volume of vacancies and the perceived ability to fill them suggests that labour demand has increasingly outpaced supply, both in terms of quantitative availability and qualitative alignment (i.e., including skills, experience, and sectoral readiness), even as filling prospects have failed to improve and have, in fact, steadily worsened over time.

Box 4: Job vacancy trends and labour market confidence in Germany, 2011-2024[1]

Figure 7: Reported and total job vacancies (BA vs. IAB[2,*]), 2011-2024**

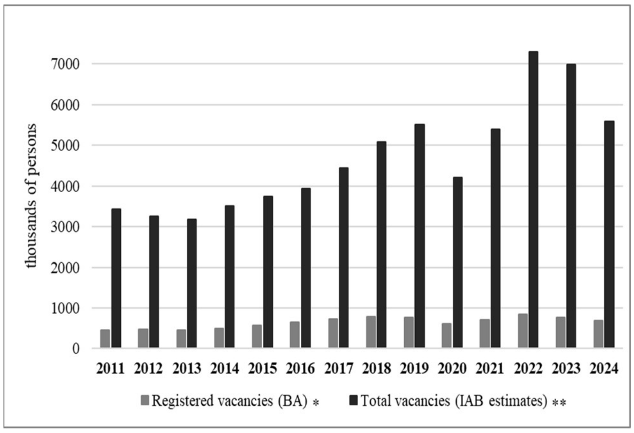
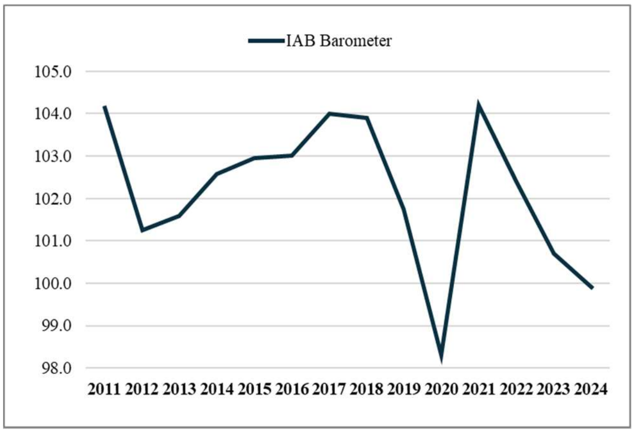


Figure 8: IAB Labour Market Barometer:annual average[3], 2011-2024



Notes:[1]The time frame 2011-2024 was selected to ensure consistency between the two indicators used in Box 4, as the IAB Labour Market Barometer is only available from 2011 onwards.[2]Although the IAB vacancy data are collected and published on a quarterly basis, we use annual aggregates here to support a consistent interpretation of long-term trends; ***The substantial discrepancy between the number of vacancies officially registered with the BA and the IAB's estimate of total vacancies is not a statistical anomaly, but a structural feature of the German labour market. This gap reflects the fact that a

[9]The deliberate inclusion of both BA figures and IAB estimates allows us to contrast formal reporting behaviour with wider labour market dynamics, offering a more nuanced understanding of the structural pressures shaping Germany's labour market.

[10]The IAB Labour Market Barometer is a confidence index based on the monthly evaluations of local employment agencies across Germany. Set against a neutral benchmark of 100, it anticipates short-term developments in employment and unemployment over a three-month period. Values above 100 reflect optimistic expectations, while those below the threshold indicate growing concerns about labour market conditions(Institute for Employment Research/IAB, 2025a). As a non-dimensional index, it operates on a scale without physical units, serving as a qualitative gauge of institutional outlook.

considerable share of employers – especially those in smaller firms or high-skilled sectors less reliant on public placement services – do not report their job openings to the Federal Employment Agency. In contrast, the IAB Job Vacancy Survey captures this unreported demand through direct employer responses at the establishment level, offering a more complete and accurate picture of labour market pressure that would otherwise remain institutionally invisible.; [3]Similarly, while the IAB Labour Market Barometer is released monthly, annual averages have been calculated by the author to ensure coherence with the vacancy data presented in Figure 7 and to enable a harmonised, year-based comparison across all indicators examined in this paper.
Source: The author's calculations and graphical representations based on data provided byFederal Employment Agency/BA (2025a,b) and Institute for Employment Research/IAB (2025a,c).

While the early post-pandemic years appeared to signal a potential rebalancing between labour supply and demand, developments in 2023 and 2024 instead point to the consolidation of structural strain. The persistence of elevated vacancy levels alongside stagnant or shrinking labour pools indicates a chronic imbalance, with no signs of meaningful correction in the short term.

To better understand the depth and persistence of these imbalances, the next section will examine their underlying structural causes in more detail, focusing on the sectoral and regional disparities that are increasingly fragmenting the German labour market and limiting its capacity to allocate human resources efficiently.

Although labour markets in many advanced economies, including Germany, have been described as "tight" since the pandemic, this phenomenon cannot be attributed solely to a numerical shortage of workers. While the number of vacancies increased significantly as labour demand surged, the issue was not simply that there were too few people available; rather, the match between jobs and job seekers became increasingly strained. In other words, Germany's labour market has been experiencing structural tensions, as opposed to a classic labour shortage (Van Doornik, Igan, & Kharroubi, 2023).As argued by Doornik, Igan and Kharroubi (2023),this imbalance is rooted in a growing disconnect between the nature of available jobs and the profiles, preferences or locations of potential candidates.

Accordingly, despite the increase in job openings since 2020 (Figure 7, Box 4), the pool of job seekers has remained relatively unchanged (Figure 9, Box 5). This pattern suggests that the observed tightening of the labour market may be less a result of a shrinking labour supply, and more a reflection of persistent mismatches[11] – e.g., in skills, geography, and occupational expectations –as highlighted in recent studies. International analyses have confirmed this tendency, emphasising that labour market tightness is often fuelled by supply-side constraints (e.g. demographic shifts, participation trends and changing worker preferences) and demand-side behaviours (e.g. labour hoarding and shifts in sectoral demand)(Bossler & Popp, 2023a).

To further clarify this evolving disparity, we examine two complementary annual indicators of labour market tightness, covering the period from 2011 to 2024 (Figure 10, Box 5). These metrics offer broad and narrow perspectives on the pressure exerted on the German labour market. The first, *Tightness A*, measures the ratio of job vacancies to the total number of job seekers, providing an overview of the balance between labour demand and potential labour supply. The second, *Tightness B*, relates job vacancies solely to the number of registered unemployed individuals, offering a more specific, institutionalised view that aligns with conventional unemployment statistics. While *Tightness A* captures the full spectrum of individuals actively seeking employment, including those already employed but looking to change jobs, *Tightness B* isolates the strain on the pool of officially unemployed jobseekers. When analysed together, these two indicators enable a more nuanced understanding of labour market tension, helping to distinguish between visible and latent mismatches in the German context.

[11]As will be shown in the relevant part of this section, the author's own calculations are limited to volume-based indicators of labour market tightness (A and B), which quantify the relationship between job vacancies and labour supply. References to skill, occupational or regional mismatches are offered as interpretative hypotheses, supported by existing empirical research rather than derived from matching-pattern data.

Box 5: Structural tensions in the German labour market: job seeker trends and tightness indicators, 2011-2024

Figure 9: Number of total job seekers and registered unemployed in June 2011-2024*

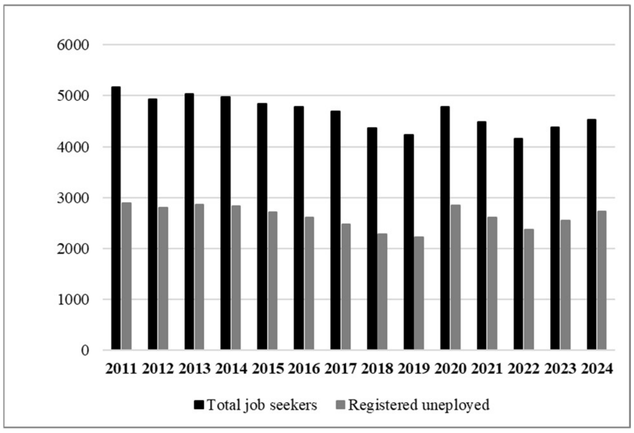
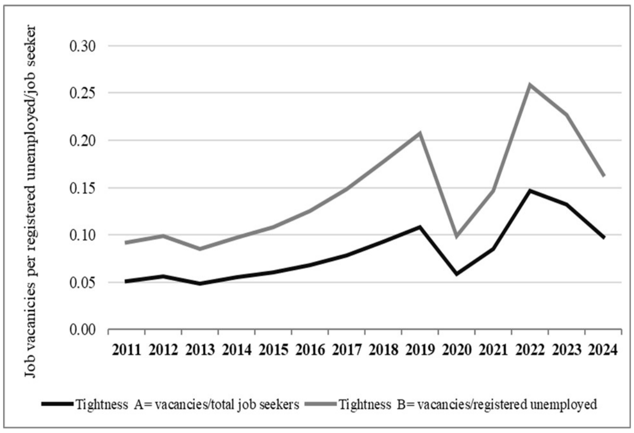


Figure 10: Labour market tightness, 2011-2024*



Notes:For the sake of methodological consistency and data comparability, this analysis adopts June as the reference month for all labour market tightness calculations. This approachaligns with established statistical conventions and the publication cycles of the Federal Employment Agency/BA(2025c) and the Institute for Employment Research/IAB(2025a),which release harmonised and methodologically validated data on job vacancies and jobseeker categories in June each year[12].The June jobseeker statistics include both registered unemployed individuals and other active jobseekers (e.g. those experiencing underemployment or participating in temporary labour market measures), providing a comprehensive approximation of labour supply.Such a practice is rooted in the IAB's established method of assessing labour market tightness over time (see Bossler & Popp, 2023) and complies with official statistical standards.
Source: The author's calculations and graphical representations based on data provided byFederal Employment Agency/BA (2025d) and Institute for Employment Research/IAB (2025c).

The low levels of labour market tightness observed in the early years of the analysed period (2011-2013) might initially suggest an oversupply of labour. However, this interpretation calls for nuance; a very low tightness ratio does not necessarily signal a healthy labour market, but may instead reflect structural mismatches, long-term unemployment, or forms of underemployment(Bossler & Popp, 2023b; OECD, 2024). The ideal is not an absence of tension, but rather a functional level of strain, high enough to indicate active demand and efficient labour mobility, yet not so high as to point to systemic shortages or recruitment bottlenecks.

As shown in Figure 10/Box 5, both labour market tightness indicators display a clear upward trend throughout the 2011-2024 period, albeit with different trajectories and intensities. *Tightness A* remained relatively low and stable during the initial years[13], reflecting a labour market with an ample supply and modest demand-side pressure. From the mid-2010s onwards, however, the indicator began to rise steadily, marking a visible shift towards a more constrained labour environment. Although the pandemic temporarily interrupted this trend, recovery was swift, and tightness levels soon surpassed pre-crisis values and have persisted at an elevated plateau in recent years.

[12]Using this mid-year benchmark provides a stable, seasonally neutral basis for interannual comparisons and avoids the distortions caused by spring transitions, year-end effects, and policy-related reporting fluctuations. Unlike the aggregation of monthly data across the full calendar year, which captures the cumulative flow of labour, using June figures provides a representative snapshot of the structural relationship between labour demand and supply at a consistent point in time.

[13]A low tightness ratio (e.g. 0.05, as registered in 2011) indicates a relaxed market, with many candidates available per vacancy, which is often associated with higher unemployment. Conversely, a high tightness ratio (e.g. above 0.10) suggests recruitment difficulties and a possible mismatch between job requirements and available profiles. A moderate level (e.g. 0.06-0.08, as observed in Germany pre-pandemic) is generally seen as functionally balanced, indicating a dynamic and well-aligned labour market.

Tightness B mirrors this general evolution, but with sharper fluctuations. The post-2015 acceleration was more pronounced, reaching peaks that suggest acute recruitment pressure within the institutionalised segment of the labour force. Even after a slight easing in recent years, the indicator remains well above earlier levels, highlighting an ongoing imbalance between available jobs and officially unemployed candidates.
Altogether, these trends indicate a structurally tightened labour market. Consequently, despite recent signs of moderation, both indicators continue to signal a high level of labour market pressure, underpinned more by structural mismatches between skills supply and demand than by cyclical fluctuations(Dorville, Filippucci, & Marcolin, 2024).

Although aggregate indicators such as labour market tightness offer valuable macro-level insights, they fail to reflect the uneven intensity of labour shortages across economic sectors. Beneath this general imbalance, sector-specific data uncover marked disparities in the distribution of unfilled positions, pointing to structural bottlenecks that are distinctly industry-bound. Analysing these differentiated sectoral dynamics is therefore essential to fully grasp the nature and persistence of labour market tensions in Germany. In this sense, Table 1 below outlines the distribution of job vacancies across major economic sectors, highlighting both absolute volumes and relative shares of total labour demand[14] between 2011 and 2024.

Table 1: Sectoral distribution of job vacancies in Germany, 2011-2024

	Primary sector	**Industry and construction**	**Commercial and logistic services**	**Professional and social services**	**Public administration and social security**	**Total**
Number of job vacancies (thousands)						
2011	21.1	658.2	865.4	1833.0	42.5	3420.2
2012	27.2	659.5	731.7	1784.3	46.3	3249.0
2013	20.8	584.4	682.9	1840.3	53.7	3182.1
2014	26.4	657.2	834.7	1921.8	65.6	3505.7
2015	34.6	685.5	829.7	2107.4	75.0	3732.2
2016	34.9	787.0	834.0	2204.2	76.5	3936.6
2017	33.4	938.2	966.8	2429.0	77.0	4444.4
2018	42.5	1175.2	1100.3	2672.2	85.6	5075.8
2019	47.7	1166.3	1257.8	2929.0	98.9	5499.7
2020	45.2	933.9	950.6	2170.1	112.8	4212.6
2021	50.7	1258.6	1081.0	2871.8	126.0	5388.1
2022	57.9	1670.4	1591.2	3817.8	163.5	7300.8
2023	48.4	1529.5	1540.9	3735.1	136.8	6990.7
2024	40.1	1125.2	1318.2	2937.8	165.0	5586.3
Share of total vacancies (%)						
2011	0.6%	19.2%	25.3%	53.6%	1.2%	100.0%
2012	0.8%	20.3%	22.5%	54.9%	1.4%	
2013	0.7%	18.4%	21.5%	57.8%	1.7%	
2014	0.8%	18.7%	23.8%	54.8%	1.9%	
2015	0.9%	18.4%	22.2%	56.5%	2.0%	
2016	0.9%	20.0%	21.2%	56.0%	1.9%	
2017	0.8%	21.1%	21.8%	54.7%	1.7%	
2018	0.8%	23.2%	21.7%	52.6%	1.7%	
2019	0.9%	21.2%	22.9%	53.3%	1.8%	
2020	1.1%	22.2%	22.6%	51.5%	2.7%	
2021	0.9%	23.4%	20.1%	53.3%	2.3%	
2022	0.8%	22.9%	21.8%	52.3%	2.2%	
2023	0.7%	21.9%	22.0%	53.4%	2.0%	

[14]In this context, "labour demand" refers to the number of job vacancies reported by employers as unfilled. It is used here as a proxy for sectoral labour market pressure, reflecting unmet demand for labour.

	Primary sector	Industry and construction	Commercial and logistic services	Professional and social services	Public administration and social security	Total
2024	0.7%	20.1%	23.6%	52.6%	3.0%	

Note: Sectoral groupings are defined by the author based on IAB vacancy statistics, aiming to provide a more coherent and comprehensive view of labour market dynamics.
Source: The author's calculations based on data provided by the Institute for Employment Research/IAB (2025c).

As the data shows, between 2011 and 2024, Germany's labour shortages remained highly concentrated in professional and social services[15], which consistently accounted for more than half of all reported job vacancies. Meanwhile, industry, logistics and construction (grouped here ascolumns 2 and 3) recorded peak vacancy levels in 2022 (a surge likely linked to post-pandemic recovery dynamics), followed by a moderate decline in 2023 and a steeper correction in 2024. The growing share of vacancies in public administration further highlights the mounting strain on institutional capacity.

This sectoral distribution also reveals several enduring significant patterns. The persistently marginal role of the primary sector highlights its declining importance in terms of Germany's labour absorption. Conversely, stable demand in professional and social services suggests deep-rooted structural needs rather than temporary imbalances. Sectors that are more volatile, such as industry and logistics, exhibit sharper fluctuations, which are likely to reflect their greater exposure to cyclical shocks and supply chain disruptions. Meanwhile, the steady increase observed in public sector vacancies indicates a gradual mounting pressure on administrative institutions, a trend with long-term implications for service delivery and institutional resilience.

This imbalance suggests that the current labour shortages in Germany are not merely quantitative but are instead rooted in the evolving mismatch between job requirements and the qualifications available. The qualification profile of job vacancies reveals a persistent structural demand for skilled vocational labour, as well as an increasing share of lower-skilled positions (Table 2). This signals distinct challenges for workforce development and training systems.

Table 2: Qualification profile of job vacancies in Germany: shares by education level in Q4[1], 2010-2023[2]

Data for the 4th quarter of the reporting year[1]	Without professional qualification/unskilled	Industrial, commercial or other training qualification incl. vocational school qualification	University of applied science degree/university degree
2010	21%	57%	22%
2011	17%	66%	17%
2012	19%	62%	19%
2013	20%	58%	22%
2014	18%	62%	20%
2015	20%	65%	16%
2016	20%	64%	16%
2017	22%	61%	17%
2018	23%	61%	16%
2019	20%	65%	15%
2020	19%	64%	18%
2021	24%	60%	16%
2022	23%	58%	19%
2023	24%	55%	21%

Notes:[1]The data refer to the fourth quarter of each year, as published by the IAB. This reference point is considered methodologically consistent and particularly suitable for capturing structural dynamics in qualification-specific labour

[15]According to IAB's data, this category includes business-related, personal, social and cultural activities.

demand, as it reflects the year's most stable and representative period, after summer-related seasonal fluctuations and before the January transition period; [2]The year 2023 marks the most recent data available at the time of writing.
Source:Data published by the Institute for Employment Research/IAB (2025c).

Although vocational training remains the main driver of labour demand, the growing number of job vacancies that do not require formal qualifications is raising concerns about shifting recruitment standards and the potential dilution of skills. The relatively modest but steady share of university-level positions reflects a structurally diverse, yet potentially fragmented, labour market. While current data do not directly capture recruitment difficulties, the evolving qualification profile suggests potential mismatches at both ends of the spectrum, namely from underqualified to overqualified candidates.

Since previous datasets lacked the occupational granularity needed for consistent tracking needed for direct comparison, the availability of 2024 figures provides a sharper lens into sector-specific hiring pressures across key sectors.To better understand how these frictions materialise in practice, Table 3 presents selected occupations with the longest average vacancy durations in 2024, a widely used proxy for recruitment difficulty. Ordered by severity, the list highlights critical bottlenecks, particularly in manual and technically skilled professions. These prolonged vacancy durations are not merely statistical indicators; they point to deeper structural frictions, qualification gaps, and sector-specific constraints that continue to shape the German labour market.

Tabel 3: Occupations with the highest recruitment difficulties in 2024 (based on average vacancy duration)

Occupation	Average vacancy duration by occupation (in days)
Insulation specialists	238
Plasterers/Stucco workers	225
Plumbing/HVAC technicians[16]	224
Elderly care workers	170
IT technicians – technical informatics	137
Truck drivers – freight transport	105
Software developers	88
IT – business informatics	66

Source: Author’s synthesis based on statistical data published by Federal Employment Agency/BA (2025e).

These prolonged vacancy durations reveal more than just staffing difficulties; they reflect structural frictions and qualification mismatches that cannot be resolved by domestic labour alone. As Germany’s economy evolves, so too must its strategies for aligning training systems, occupational standards, and real labour market needs, including the systematic integration of foreign workers in sectors where the local workforce is insufficient.

4.3 Skills and qualification mismatches: the silent engine of structural tightness

As shown in the previous section and confirmed by the Federal Employment Agency’s Annual Labour Market Report 2024 (Federal Employment Agency/BA, 2025e), recruitment bottlenecks persist in sectors characterised by high qualification demands and limited domestic labour reserves, particularly in healthcare, construction and IT. Beyond the specific examples already highlighted, the chart below (Table 4) provides a broader categorisation of occupations currently facing high demand, grouped by qualification level, ranking from qualified professionals to highly specialised experts. This layered classification underlines the structural nature of recruitment shortages across the German labour market.

[16]According to the BA, HVAC technicians (Heating, Ventilation and Air Conditioning) are responsible for the installation, maintenance and repair of climate control systems in residential, commercial and industrial buildings. This professional category is among the technically skilled occupations facing persistent recruitment difficulties in Germany.

Table 4: Key occupations affected by labour shortages, by qualification level (2022-2024)

Qualified professionals	Specialists	Experts
- Professions in nursing; - Medical assistants (w/o specialisation); - Professions in automative engineering; - Medical assistants in dentistry;	- Professions in childcare and education; - Professions in physiotherapy; - Professions in specialist nursing; - Professions in ergotherapy;	- Professions in software development; - Physicians(w/o specialisation); - Teachers in secondary schools; - Professions in architecture; - Professions in construction project planning and supervision.
The category typically includes:		
→ individuals who have completed at least two years of vocational education and training or hold an equivalent non-academic qualification. They typically occupy hands-on technical or operational roles within their field;	→ workers with advanced vocational credentials such as master craftsperson titles, technician diplomas, or equivalent qualifications, including certain academic degrees. Their expertise often combines practical know-how with sector-specific depth;	→ highly educated professionals with at least a four-year university degree or equivalent academic training. They are commonly employed in roles that demand strategic, scientific, or planning capacities, often beyond the scope of traditional vocational routes.

Source: Adapted by the author based ondata published by Federal Employment Agency/BA (2024; 2025e) andThe Federal Government (2025).

Although Germany's dual vocational training system, which combines in-company apprenticeships with classroom-based instruction, remains a central pillar of workforce integration, thousands of apprenticeship positions continue to remain unfilled each year, particularly within small and medium-sized enterprises (SMEs).

Despite targeted efforts to modernise and internationalise the system, vocational training faces growing difficulties in attracting, retaining, and effectively matching trainees with real labour market opportunities. In 2024 alone, nearly 69,400 vocational training places remained vacant, surpassing the figure for 2022 (68,868) and almost doubling that for the 2014(37,101).

This persistent undersubscription, especially among SMEs, signals a widening gap between the supply of training and the expectations or availability of young labour market entrants. This resulting imbalance not only undermines the functioning of the vocational pathway, but also contributes to structural hiring frictions, as evidenced by prolonged vacancy durations and an increasing reliance on international recruitment.

Beyond the widely recognised training gaps, a recent report published under the auspices of the Federal Institute for Vocational Education and Training in early 2025(Langen & Dörsam, 2025) reveal a more subtle yet structurally embedded misalignment in the German labour market: the relationship between apprenticeship remuneration and occupational shortages. Between 2020 and 2023, average earnings in vocational training increased most notably in low-paying sectors with persistent shortages of applicants, leading to a partial convergence across regions and fields. While this trend of wage equalisation is encouraging at first glance, it also highlights a deeper systemic tension: even as remuneration improved in several key shortage areas, such as technical trades, hospitality, and care services, thousands of positions remained unfilled.

According to Langen and Dörsam (2025), who investigated the interplay between apprenticeship supply, remuneration levels and recruitment difficulties, the average monthly apprentice wage across all training years was EUR 966 in 2023. However, there were significant differences between sectors: while wages in banking and public administration exceeded EUR 1,200, those in manual trades or social care often remained below EUR 900. These discrepancies reflect economic stratification, as well as a divergence between vocational training offerings and the real preferences or expectations of younger generations.

Furthermore, the report emphasises the ongoing presence of regional and qualitative imbalances in training provision, as well as the limited adaptability of curricula to evolving workplace demands. Despite its undisputed importance for workforce formation, Germany's dual training system development, demographic shifts, sectoral undervaluation and evolving aspirations among new labour market entrants are increasingly constraining its ability to deliver effective alignment between supply and demand.

To address the structural frictions hampering Germany's vocational training landscape, federal authorities have intensified their efforts in recent years to promote inclusive apprenticeship models, particularly targeting young migrants and refugees. According to the latest Annual Labour Market Report released by the Federal Employment Agency (2025e), approximately one in four applicants for vocational training positions in 2024 had a migration background, a proportion that has steadily increased over the past decade. Targeted support programmes, such as language training, preparatory bridging courses, and mentoring schemes, have facilitated access for non-German nationals, contributing to the stabilisation of training participation rates. While challenges persist, notably in matching migrant applicants with suitable enterprises, the expanding involvement of refugees and immigrants has helped to partially revitalise local labour markets, particularly in sectors facing demographic challenges, such as crafts and care (Table 5).

Table 5: Participation of refugees and immigrants in training and employment, 2020-2024

	Participation in vocational and qualification training programmes		Participation in employment	
	Refugees	Immigrants	Refugees	Immigrants
2020	24,000	220,000	335,000	3,860,000
2021	24,000	225,000	357,000	3,960,000
2022	23,000	230,000	382,000	4,060,000
2023	24,000	230,000	405,000	4,110,000
2024	27,000	232,000	428,000	4,170,000

Source: Author's synthesis based on annual labour market reports (2020–2024) published by the Federal Employment Agency/BA.

These persistent inconsistencies between qualification profiles, occupational structures, and regional labour demand underscore the need for a more flexible and forward-looking policy response. As Germany faces a narrowing demographic window and increasing structural rigidity, the adequacy of existing measures must be reassessed. The following section examines recent policy interventions, evaluating both their achievements and their limitations in addressing the evolving contours of labour market tightness.

5. Policy responses to labour market tightness and their systemic limits

Over the past decade, German policymakers have responded to labour market imbalances by implementing a complex mix of activation strategies, training incentives and support measures aimed at increasing workforce participation. These interventions have increasingly targeted structurally underrepresented groups, including older workers, women and, more recently, refugees and immigrants, while also seeking to enhance the adaptability of firms and training institutions. A series of tools has been deployed to strengthen vocational alignment and reduce recruitment bottlenecks, from the expansion of language and pre-apprenticeship programmes to the financial support for SMEs and the digitalisation of counselling services.

5.1. Measures to activate and upskill the workforce

In the face of mounting recruitment pressures and a shrinking domestic labour pool, German policymakers have broadened their focus to include activating untapped segments of the population and enhancing the qualifications of the existing workforce. These efforts have increasingly targeted groups that are structurally underrepresented, such as older workers, women returning to work, refugees and immigrants (more recently), as well as young adults who are facing difficulties transitioning from school to work. Germany's implementation of the *Youth Guarantee*, for example, has offered tailored support in the form of counselling, training and employment services, paying special attention to those from disadvantaged backgrounds or remote areas(European Union, 2025). The active involvement of these underrepresented segments has become vital in addressing occupational shortages.

Central to these initiatives has been the expansion of language support, bridging courses, and vocational orientation schemes tailored for non-German nationals. Between 2020 and 2024, participation in qualification programmes among immigrants steadily increased, supported by mentoring initiatives and enhanced access to preparatory apprenticeships. At the same time, targeted subsidies for SMEs, the digitalisation of counselling services, and regional training alliances have sought to improve matching processes and reduce dropout rates (Federal Employment Agency/BA, 2024, 2025e).

Despite these measures, significant gaps remain in aligning training pathways with real labour market needs. Structural mismatches, sectoral undervaluation, and the limited responsiveness of vocational curricula continue to constrain the full impact of activation strategies. Nonetheless, the evolving policy mix reflects a growing recognition of the need to better integrate vulnerable groups and enhance the long-term adaptability of Germany’s workforce.

5.2. Supporting reintegration through counselling and mutual commitments

In Germany, the Federal Employment Agency plays a central role in supporting the reintegration of jobseekers into the labour market, beyond its traditional role as administrator of unemployment benefits. Its core services include job placement, personalised counselling and developing individualised activation plans tailored to each applicant’s profile (BA, 2024).

Every registered jobseeker undergoes an initial skills and barriers assessment, after which they conclude an Integration Agreement (*Eingliederungsvereinbarung, in German*) setting out reciprocal obligations. In return for financial support and advisory services, clients commit to actively searching for a job and participating in assigned activities. Counsellors monitor compliance and may impose sanctions depending on the type of benefit and the severity of non-compliance.

Although this logic of conditionality is intended to strengthen accountability and accelerate labour market reintegration, it has its limitations. Standardised agreements often leave limited room for adaptation to complex life realities, especially for vulnerable groups. As recent analyses have highlighted(Bossler & Popp, 2023a), an overly rigid approach may risk undermining motivation and trust. More flexible, tailored support strategies that respond to diverse personal circumstances are increasingly recognised as vital for sustaining engagement and long-term success.

Yet, beyond their procedural role, integration agreements remain controversial instruments. Although they are intended to embody the ’’support and challenge’’ principle enshrined in SGB II[17], studies have shown that they are often perceived as one-sided and overly formalistic. A series of analyses conducted by IAB (Bernhard & Senghaas, 2021)revealed that agreements tend to emphasise obligations and potential sanctions more than mutual support or flexible guidance. Furthermore, the complexity of these documents, coupled with asymmetrical power dynamics where subsistence security is at stake, can hinder the establishment of genuine joint goals. A significant proportion of jobseekers reported having limited opportunities for in-depth consultation or continuity with a dedicated counsellor, despite legal provisions for such personalised support. These findings suggest that, while integration agreements remain central to Germany’s reintegration framework, their implementation in practice requires more empathy, clarity, and mutual accountability.

[17]SGB II refers to Social Code Book II (*Sozialgesetzbuch Zweites Buch*), which sets out the rules for providing basic income support to jobseekers in Germany. It establishes the legal framework for activation policies, integration agreements, counselling services and the conditions for receiving unemployment benefits.

5.3 Targeted qualification programmes for low-skilled and older workers

In response to long-standing skill gaps and accelerating structural change, Germany has developed targeted training schemes for low-skilled adults and older workers, who are often underrepresented in upskilling initiatives.

One of the most relevant instruments is WeGebAU[18] (*Further training for low-qualified and older employees within companies*), a programme designed to support continuing vocational training within companies, particularly in SMEs. It provides financial subsidies to cover training costs and lost wages during participation. The programme has been particularly effective for employees without formal qualifications and older workers whose skills no longer match market demands(CEDEFOP, 2020).

To complement this, the Initiative to Accompany Structural Transformation (*Initiative zur Flankierung des Strukturwandels* in German; IFlaS) was launched to address the regional impact of industrial transitions. It promotes longer retraining courses that lead to certified qualifications, with a focus on sectors that are most affected by technological change and climate policies. IFlaS works closely with local employers and chambers of commerce to ensure that qualification efforts directly respond to labour market needs(Cedefop&BIBB), 2023).

Both programmes emphasise certified vocational pathways to foster more stable reintegration outcomes. According to the sources cited above, participants in these schemes – especially those who were previously long-term unemployed or had fragmented employment histories – showed improved job prospects and increased participation in sectors facing acute labour shortages.

However, challenges remain in reaching the most disadvantaged groups, particularly those with limited digital or language skills. Furthermore, administrative complexity and low awareness among employers continue to hinder the realisation of the full potential of these tools. To scale their impact, especially in structurally weak regions, a more proactive outreach strategy and simpler funding procedures are needed.

5.4 Enhancing inclusion and addressing structural discrimination

In addition to traditional activation measures, German labour market policy has increasingly sought to foster social inclusion and address structural barriers affecting marginalised groups. A key part of this approach is the Social Labour Market (*Sozialer Arbeitsmarkt* in German, cf. Art. 16i SGB II), which provides long-term subsidised employment for people who have been unemployed for a long time and face significant barriers to finding a job(Institute for Employment Research/IAB, 2025d).

The programme targets individuals with multiple disadvantages, including health-related limitations, age-related challenges, and a lack of formal qualifications. Eligibility criteria are carefully defined to ensure that support reaches those furthest from the labour market. Participation is voluntary, and placements are designed to mirror regular employment relationships as closely as possible, offering stable contracts, defined working hours and a sense of purpose.

To maximise reintegration prospects, the model relies on personalised support, combining subsidised employment with medical, psychological, or socio-pedagogical counselling where necessary. This tailored approach helps build self-confidence and restore work capacity gradually. Studies have shown that commitment levels rise when placements reflect real work contexts and are accompanied by structured guidance.

Furthermore, policy efforts have begun to embrace an intersectional approach, recognising that people often experience multiple forms of exclusion based on factors such as gender, ethnicity, disability or age. Initiatives promoting diversity in recruitment, particularly in technical and male-dominated sectors, have expanded through targeted incentives, coaching and awareness campaigns.

[18]The acronymderives from the German title of the programme: *Weiterbildung Geringqualifizierter und Beschäftigter Älterer Arbeitnehmer in Unternehmen*).

Overall, the Social Labour Market represents a shift from passive support to empowered, socially embedded reactivation. However, its scalability is limited by funding constraints and the stigma surrounding subsidised work. For this model to meaningfully contribute to addressing labour market tightness, its value must be recognised as both a social instrument and a long-term economic investment in cohesion and human potential.

As the analysis has shown, recent efforts reflect an increasing awareness of deep-rooted structural challenges. However, the limited coherence, scope and impact of existing measures continue to hamper the development of a truly resilient German labour market, underscoring the need for a more integrated and forward-looking strategy.

6. Conclusion

As the analysis has shown, Germany's labour shortages are rooted in a long-term demographic transformation characterised by persistently low fertility rates and steadily increasing life expectancy. These shifts have accelerated population ageing, widened the generational imbalance and placed increasing pressure on the labour supply. Despite recent compensatory trends, such as net migration and isolated improvements in birth rates, these have not been sufficient to reverse the broader demographic trajectory.

At the same time, labour market tensions have deepened due to the structural mismatch between the rising number of job vacancies and the declining capacity of the labour market to absorb and match them, in both quantitative and qualitative terms. The persistent discrepancy between reported labour demand and jobseeker availability, coupled with ongoing recruitment challenges in critical sectors such as care, construction, logistics, and IT, indicates a systemic misalignment that cannot be resolved through cyclical recovery alone.

Sectoral analysis reveals that the shortages are widespread and unevenly distributed, with social and professional services absorbing most of the unfilled positions. Furthermore, vocational training is under strain as thousands of apprenticeships remain unfilled each year and there are persistent structural mismatches between training provision, wage incentives and the expectations of new labour market entrants.

Overall, the findings suggest that the labour market is tightening less due to a lack of people and more due to a disconnect between population dynamics, skill formation, and the evolving requirements of the economy. While these tensions have been developing for some time, they are now manifesting with increasing urgency, calling for more anticipatory, systemic and policy coherent responses.

While Germany has implemented a wide range of policy instruments to address labour market tightness, the effectiveness of these measures is limited by structural inertia and fragmented implementation. Despite notable efforts to expand vocational training, strengthen counselling and integration schemes, and promote inclusive employment through targeted programmes such as WeGebAU, IFlaS and the Social Labour Market, these initiatives often lack the necessary scale, coordination and adaptability to respond effectively to changing labour market dynamics.

The persistent mismatch between qualifications and real labour market needs, the bureaucratic rigidity of activation tools and the uneven accessibility for underrepresented groups highlight systemic barriers. Many interventions are reactive rather than forward-looking, narrowly focused rather than integrated, and insufficiently tailored to the complexity of long-term demographic and occupational shifts.

As such, while recent policy developments reflect an increasing awareness of the structural fragilities of the labour market, the current framework still lacks the strategic coherence and anticipatory depth required to ensure sustainable workforce resilience.

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