

Determining Labour Shortages and the need for Labour Migration in Germany: Focus-Study by the German National Contact Point for the European Migration Network (EMN)

Vollmer, Michael

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Federal Office
for Migration
and Refugees



Determining Labour Shortages and the need for Labour Migration in Germany

Focus-Study by the German National Contact Point
for the European Migration Network (EMN)

Working Paper 64

Michael Vollmer



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Determining Labour Shortages and the need for Labour Migration in Germany

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European Migration Network (EMN)

Michael Vollmer

Federal Office for Migration and Refugees 2015

Summary

This study maps out important aspects and basic assumptions in relation to the debate about current skilled labour shortages and the future demand for skilled labour in Germany. It also provides an overview of the most important parameters and calculation bases used to determine and further observe skilled labour shortages and skilled labour supply.

There is no “King’s variable” available to determine skilled labour shortages. Thus, it is difficult to adopt a methodical approach to working out exact figures. This is rendered even more difficult by the fact that both the mobility of employees, the internal permeability of corporate structures and the orientation of job profiles are extremely dynamic.

The Federal Employment Agency (Bundesagentur für Arbeit, BA) is, amongst others, involved in some aspects of the procedure for granting third-country nationals access to the labour market and is also responsible for conducting the “skilled labour shortage analysis” which is published every six months. Due to the large number of parameters that need to be taken into account and the problem associated with recording actual shortages methodically, the Federal Employment Agency never mentions a specific number of skilled workers who are likely to be required in future. Therefore, the current migration policy and planning is focussed on some privileged groups of qualified professionals. Nevertheless, no target is set for the number of shortage occupations.

There are no signs of a nationwide shortage of skilled labour in Germany. Currently, nationwide skilled labour shortages can only be identified in the healthcare and nursing care professions. Notwithstanding the aforementioned, temporary and regional skilled labour shortages certainly exist in other industries. They can be recorded using empirical and analytical means, providing a snapshot of the labour market.

Against the backdrop of the demographic trend in Germany, political measures need to be taken, in order to ensure a sufficient supply of skilled labour available in the medium and long term. Yet migration is an undisputed and by no means singular component in the overall strategy aimed at securing the basic supply of labour. Migration from third countries is gaining momentum, compared to migration from other EU Member States within this strategy. Labour migration from third countries can be managed more effectively by amending statutory provisions. Moreover, other Member States of the European Union, from which the majority of immigrants came in recent years, are confronted with similar demographic challenges.

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1 Introduction

With a workforce of around 42.7 million gainfully employed persons (status: May 2015), Germany currently has the biggest labour market within the European Union. During the robust economic situation of the last few years it has grown steadily. This applies to the labour market in general and to employees liable for compulsory social-insurance payments in particular. The growth of the labour market went along with a simultaneous decline in the number of unemployed persons and also with the discussion about how to satisfy the demand for skilled labour if the economy continues to flourish. There has been repeated mention of skilled labour shortages in discussions about the labour market in recent years which will reportedly present the German economy with huge challenges. For against the backdrop of the demographic trend of society, the question arises in this context not only how growth-related needs for additional labour can be met but also how the current supply of skilled workers can compensate for workers who reach retirement age leaving the workforce. Against this backdrop, the term “skilled labour shortage” has garnered much publicity. Yet, in many respects it has remained an abstract term that conceals the need for differentiation behind the phenomenon named after it.

In this context, the question arises to what extent a skilled labour shortage actually exists in Germany and whether the skilled labour shortage is temporary and/or limited to certain regions. If skilled labour shortages do exist, how can they be identified and measured? Which occupations or occupational fields are affected most by skilled labour shortages? What methodical challenges and difficulties are associated with the calculation models most commonly used at present? What role do migrants from third-countries play in satisfying actual demand for labour and in compensating for (potential) labour shortages? These and additional questions will be answered in the following.

This focus study has been carried out within the framework of the European Migration Network (EMN). It was conducted by all participating EU Member States as well as Norway based on uniform criteria and a largely predefined structure and will ultimately be integrated into a comparative synthesis report with the studies of other national EMN Contact Points.

It will not just analyse the most important parameters in the debate about skilled labour shortages, but will simultaneously identify the most important players involved in observing the labour market and last but by no means least the general statutory conditions that enable migrants from third countries to become gainfully employed in occupations and professions subject to labour shortages in Germany. Whereas Chapter 2 will provide an overview of the most important general data on the German labour market and information on the main pathways for action aimed at reducing unemployment and avoiding future skilled labour shortages identified by the Federal Government, the third Chapter will address the demographic trend in Germany and the decline in the supply of skilled labour that has been predicted for the medium and long term in Germany. Sub-chapter 3.3 will outline the extent to which migration has the capacity to help stabilise the supply of skilled labour.

Given that skilled labour shortage has been the subject of very controversial discussions in recent years, the fourth Chapter of this study will look at the most important positions within the debate about skilled labour. Chapter 5 will look at the general structural conditions that enable third-country nationals to take up employment in Germany. As such, the Federal Employment Agency plays a key role in the process of admitting people to the labour market in Germany. The sixth Chapter will not only outline the general statutory conditions assigning a key role to the

Federal Employment Agency but at the same time will cover the labour shortage analysis conducted by the Federal Employment Agency on the basis of which it becomes possible to identify skilled labour shortages in the individual occupations and professions and in the individual regions within Germany. Chapter 7 will provide a brief overview of the various players involved in observing the labour market whose analyses and data certainly influence the political debate about actual and potential skilled labour shortages in Germany. Chapter 8 will outline the current challenges and methodical problems associated with recording labour shortages, before chapter 9 summarises the main findings.

2 Labour market in Germany

2.1 Labour market policy: initial situation

The German labour market has changed markedly in the past few years and is today characterised by a steady, high level of employment and decreasing unemployment. However, although there has been a slight increase in the potential labour supply (headcount), there has been a significant increase in the number of gainfully employed persons and in the number of employees liable for compulsory social-insurance payments (Vogler-Ludwig et al. 2015: 71). The number of gainfully employed persons rose to 42.6 million in 2014. By contrast, the number of unemployed persons decreased by around 2 million between 2005 and 2014. Since 2005 the number of unemployed persons in Germany decreased steadily, except of the year 2012 in which the unemployment rate rose from 6.8 to 6.9 percent. Whereas the average number of unemployed persons totalled 4.86 million back in 2005, it had fallen to around 2.9 million by 2014. The average rate of unemployment in Germany as a whole was 6.7 percent in 2014, although there remain some major differences in terms of regional distribution. Whereas the rate of unemployment in western Germany was 5.9 percent, it was 9.8 percent in eastern Germany, again with the regions developing at very different rates. And in addition, there is certainly evidence of a North-South divide in both western and eastern Germany.

In recent years and decades, the German labour market, furthermore, developed more and more into a skilled labour market. Owing to this gradual process which is still ongoing, there has been a sharp decline in the number of jobs available for unskilled workers. This highlighted the problem of structural unemployment in Germany because it hardly decreased at all despite the flourishing economic situation. At present, approximately 2 million unemployed persons are receiving basic income support financed by taxes (pursuant to the Social Code Book II), fewer of these persons transition or return to the mainstream labour market than from the system of contributions-based unemployment insurance (pursuant to the Social Code Book

III) (Bittorf 2015: 4). They are frequently persons who have enormous difficulties to get access to the labour market owing to a lack of school-leaving certificates and vocational training qualifications. And this group frequently includes migrants, some of whom have been residing in Germany for many years. Yet, newly arrived immigrants are often better qualified. The overall rate of unemployment among this segment of the population is currently at 20.8 percent (West) and 8.3 percent (East), which is significantly higher than the average among other groups of workers (Bittorf 2015: 2).

The study conducted by the Federal Employment Agency in 2013 “Der Arbeitsmarkt in Deutschland – Menschen mit Migrationshintergrund auf dem deutschen Arbeitsmarkt (The Labour Market in Germany – Persons with a Migration Background in the German Labour Market)” sheds light on the origin and level of qualifications of unemployed persons in Germany. Of the around 2.9 million unemployed persons at the time only around 2.6 million were interviewed and captured by the time the study was printed in December 2013. Out of these, 2.17 million provided information about their migration status. However, no distinction is made between EU nationals and third-country nationals in this study. Other statistical surveys carried out by the Federal Employment Agency reveal that EU nationals account for between 24 percent and 29 percent of unemployed foreigners.¹ Out of the unemployed persons covered by this study, around 770,000 and therefore around 35.5 percent had a migration background. The share of persons born abroad with own migration experience is at 595,000 (27.4 percent), including 340,000 foreigners who are classified as non-skilled workers since they do not have any vocational qualifications (approximately

1 The Federal Employment Agency publishes detailed monthly statistics under the heading “Analyse des Arbeitsmarktes für Ausländer (Analysis of the labour market for foreigners)” which can be accessed under the following link: <https://statistik.arbeitsagentur.de/Navigation/Statistik/Statistische-Analysen/Analytikereports/Zentral/Monatliche-Analytikereports/Analyse-Arbeitsmarkt-Auslaender-nav.html> (9 April 2015).

263,000). Whereas one-third of unemployed persons without a migration background had no vocational qualifications, the values range from 47.4 percent of Germans born in Germany with at least one migrant parent to 76.5 percent of unemployed foreigners with their own migration experience (BA 2014d: 5ff.). Although the shares in unemployment as a whole vary greatly between the individual Federal Länder, they do show that in addition to having no vocational qualifications whatsoever, problems exist regarding the recognition of qualifications obtained abroad (cf. Chapter 5.2).

Although it is worth noting in this context that there is no lack of unskilled and semi-skilled workers and that this group of qualifications is not included in any of the lists of skilled labour shortages of the Federal Employment Agency, the contingent of persons without any vocational qualifications – regardless of their country of origin – is part of a larger overall strategy adopted by the Federal Government to ensure there is a steady supply of skilled labour in Germany. In addition to training, partial qualifications and second-chance training for foreigners (and Germans) already residing in Germany, skilled workers from third countries and people coming to Germany for educational purposes are becoming more and more important within this long-term strategy.

2.2 Progress report of the German Federal Government's skilled workers concept

In the latest progress reports on the skilled labour concept drawn up by the Federal Government, the stakeholders have identified five pathways for ensuring that the demand for labour is met which are certainly worthwhile observing and further developing (BMAS 2014; 2015). They include:

1. Activation and mobilisation of labour reserves (women, older people),
2. Reconcilability of family needs and working life,
3. Educational opportunities for everyone from the outset,
4. Better training and further education,
5. Integration and skilled immigration.

Persons with a migration background in general were identified as one of the two focal points in the current progress report, although no explicit distinction is made between EU foreigners and third-country nationals is made. Notwithstanding this, third-country nationals represent a special target group in the concept for securing the supply of skilled labour, since it is assumed that many EU nationals who moved to Germany in the recent wake of the economic crisis in Europe will actually end up returning to their countries of origin once their financial situation has improved. In addition, many EU countries will face similar demographic changes in the medium to long term and will be affected by a reduction in the labour supply potential just like Germany. This means that their own nationals are bound to become a valuable human resource and will probably be in high demand in the labour markets of the countries of origin in the foreseeable future. The majority of long-term projections are also based on this assumption (cf. Chapters 3 and 7.4).

By contrast, there are several groups of qualified persons and persons undergoing training in the group of third-country nationals who are moving into the political spotlight within the framework of this overall strategy. Students who have been granted a residence permit for the purposes of studying in Germany are, for instance, commanding special attention among companies and political decision-makers. Students studying so-called MINT subjects (mathematics, informatics, natural sciences, technology) are of special interest in terms of recruitment of skilled workers, as a particularly high number of third-country nationals is enrolled for these courses (cf. Table 1) at universities. Indeed the past has shown that around 44 percent of all so-called foreign students studying these subjects do actually become gainfully employed once they have completed their studies (Koppel 2015; Mayer et al. 2012).

Persons who have successfully completed vocational training and who have the opportunity to take up employment in Germany that is commensurate with their vocational qualifications are increasingly becoming the focus of attention. In addition, companies and decision-makers are focusing more on asylum seekers and foreigners whose deportation has been suspended and who represent a growing group of third-country

Table 1: Foreign students broken down by groups of subjects and most frequent nationalities in the winter semester of 2013/14

Nationality	Most frequent groups of subjects							
	Total	of which foreign students	Linguistics, humanities	Law, economics, social sciences	Mathematics, natural sciences	Engineering	Human medicine	Art, visual arts
Turkey	33,004	6,701	4,337	9,737	6,657	10,780	739	463
China	30,511	28,381	3,603	6,264	5,237	12,532	592	1,600
Russian Federation	14,525	11,126	3,254	5,173	2,399	2,019	454	921
India	9,619	9,372	241	894	3,029	4,964	263	38
Ukraine	9,212	6,411	2,194	3,322	1,552	1,262	316	399
Iran	6,607	5,463	562	894	1,841	2,482	384	228
Cameroon	6,408	6,200	276	1,147	1,633	2,987	265	4
Vietnam	5,597	3,013	494	1,915	1,258	1,624	92	99
Republic of Korea	5,518	4,534	956	903	398	615	231	2,284
Morocco	5,165	4,490	454	922	1,058	2,612	76	11
Unites States	4,855	4,298	1,689	1,408	570	474	179	357
Sum total of above mentioned nationalities	131,021	89,989	18,060	32,579	25,632	42,351	3,591	6,404
Total number of foreign students	301,350	218,848	50,596	79,390	53,393	79,745	14,458	16,019

Source: Statistisches Bundesamt 2014

nationals residing in Germany. In the opinion of the Federal Employment Agency, around one-fifth of asylum seekers currently have an academic degree and one-third have vocational qualifications (Gillmann/ Specht 2015: 8). Whereas regulations granting foreigners whose deportation has been suspended access to the labour market were eased in 2014 (cf. Chapter 5.3), a public discussion about leveraging the skilled labour potential more effectively among asylum seekers is currently fully underway. One of the arguments frequently used is the growing difficulties companies are having filling apprenticeships and other jobs. This is presenting some handicrafts industries with enormous challenges when it comes to securing the future of businesses against the backdrop of demographic change.

3 Labour market and demographic changes

3.1 Demographic assumptions

The discussion about the migration of skilled workers from third countries is based on a growth paradigm and is explained by the demographic change. The decline in the birth rate, the ageing of the population, and the risk of a shrinking population and of the potential labour supply are key terms often connected to a decline of the potential of total value added (GDP).

One problem that manifests itself in the training and apprenticeship market today already is the low birth rate of the past years and decades. Whereas 1,357,304 babies were born in Germany in 1964, only 682,069 children were born in 2013.² A similarly low number of births is anticipated for 2014. Since 1972, there have been more deaths than births each year in the area of the reunited Germany, whereas the birth rate in the German Democratic Republic differed a little from the birth rate in the former Federal Republic. There was even a slight excess of births over deaths in the early 1980s. The fact that the population (and indeed also the number of gainfully employed persons) in the territory of today's Federal Republic has risen from 78.8 million in 1972 to around 80.8 million in 2014 can be attributed to migration alone. The issue of how to ensure there is a steady supply of skilled labour is gaining momentum, in view of the fact that the baby boomers of the 1950s and 1960s will be reaching retirement age in the foreseeable future and will therefore be leaving the workforce. In contrast, the upcoming cohorts are much smaller than those leaving the labour market in the next years. Currently, there are around 42.7 million gainfully employed persons in Germany (status: May 2015), although the number has risen steadily in the

past few years (cf. Table 2). The actual potential labour supply, by contrast, is even larger. It is calculated from the number of gainfully employed persons, the number of unemployed persons (approximately 2.2 million) and the so-called hidden reserves (approximately 1 million). These figures do not include asylum seekers residing in Germany.

Table 2: Gainfully employed persons in Germany on an annual average (in 1,000)

Year	Resident in Germany (national concept of employment)	Employed in Germany (national concept of employment)
2005	39,220	39,326
2006	39,559	39,635
2007	40,259	40,325
2008	40,805	40,856
2009	40,845	40,892
2010	40,983	41,020
2011*	41,522	41,570
2012*	41,979	42,033
2013*	42,226	42,281
2014*	42,598	42,652

* Preliminary statistics Source: Statistisches Bundesamt 2015

As the baby boomers gradually leave the workforce, the number of gainfully employed persons will not just decrease visibly in the years to come, as current calculations suggest. Even if untapped potential is activated in an optimal way, it will be impossible to compensate for the decline in labour supply. Not even significant increases in productivity, e.g. owing to ongoing automation of operational processes and reduction in the number of registered unemployed persons (currently 3.1 million), might make up such a shortage.

² The Federal Statistical Agency publishes data and long series about the natural demographic trend in Germany, for instance, under the following link: <https://www.destatis.de/DE/ZahlenFakten/Indikatoren/LangeReihen/Bevoelkerung/lrbev04.html> (14 April 2015).

Table 3: Basic assumptions made in the 12th Coordinated Population Forecast (2009)

Parameters	Assumptions		
	Birth rate (children per woman)	Life expectancy of those born in 2060	Migration per year
“Medium-aged” population, lower limit	more or less steady at 1.4	basic assumption: 8 years more for boys, 7 years more for girls	from 2014 by 100,000
“Medium-aged” population, upper limit			from 2020 by 200,000
“Relatively young” population	slight increase to 1.6	basic assumption	from 2020 by 200,000
“Relatively old” population	decrease to 1.2	sharp increase, 11 years more for boys, 9 years more for girls	from 2014 by 100,000

Source: Statistisches Bundesamt 2009

3.2 Demographic calculation schemes

The current long-term forecasts in relation to demographic trends in general as well as the development of labour supply potential in particular are based on the “Coordinated Population Forecasts” undertaken by the Federal Statistical Office.³ In the 12th Coordinated Population Forecast for Germany, issued in 2009, the age group of 20 to 64-year-olds is the group most relevant for the labour market even though the projection is based on different assumptions. The number of births, life expectancy and anticipated migration which varies between 100,000 and 200,000 depending on the case scenario are the parameters used for the calculations undertaken by the Federal Statistical Office (cf. Table 3). Depending on the choice of the model, the cumulative migration figures for the period between 2009 and 2060 range between 4.9 million and around 9.4 million. Although no distinction between EU nationals and third-country nationals expected to migrate to Germany is made, there are too many uncertainties associated with migration movements.

Depending on what projection model is used, it is possible to make a statement about the upper and lower limits for the anticipated size of the population. Albeit, it needs to be borne in mind that projections always involve a large number of uncertainties and that exogenous trends cannot, or at least not adequately, be taken into account. The sustained high migration to Germany was neither predicted in any of the case scenarios taken into account nor was the “statistical population decline” witnessed after the 2011 census when the size of the population had to be adjusted downwards from around 81.7 million to 80.2 million. Irrespective of this, it can be assumed on the basis of this projection model that there will be a sharp decline in the number of gainfully employed persons and in the labour supply potential from 2020 onwards as a result of the demographic trend (cf. Table 4).

Table 4: Population of working age (20 to 64) according to the 12th Coordinated Population Forecast (2009)

Year	“Medium-aged” population in millions	
	Minimum level	Maximum level
2008	50	50
2020	48	48
2030	42	43
2040	38	40
2050	36	39
2060	33	36

Source: Statistisches Bundesamt 2009

³ The results of the 13th Coordinated Population Forecast were published in April 2015. As the projection models drawn up here are not yet utilised for scientific purposes, it is mainly the data from the 12th Coordinated Population Forecast issued in 2009 and the studies based on it that will be used in the following.

Table 5: Inward and outward movement broken down by selected age groups (2010-2013)

Year	Inward movement			Outward movement			Migration balance in age groups that are relevant for the labour market
	18 to under 25	25 to under 40	40 to under 65	18 to under 25	25 to under 40	40 to under 65	
2010	178,705	322,066	190,046	113,107	277,260	189,454	110,996
2011	208,566	391,592	232,851	118,508	280,461	191,527	242,513
2012	234,045	439,078	259,153	126,286	294,168	201,330	310,492
2013	266,116	490,506	286,647	141,985	328,611	223,747	348,926

Source: Statistisches Bundesamt 2014

A number of studies (cf. Chapter 7.4) have been carried out on the basis of these statistical projections, capturing the foreseeable trend and attempting to issue recommendations for action. To what extent the statistics available indicate a general or a more particular skilled labour shortage has been the subject of many controversial discussions in the past few years. For on the basis of fundamental assumptions, the 12th Coordinated Population Forecast runs through other projection models that predict net migration of up to 400,000 persons per year which could potentially stabilise not just the labour supply potential but the actual size of the population in the long term. Yet even the assumption that there will be any net migration at all in the next few years is viewed with scepticism.

3.3 Contribution of migration towards securing the skilled labour basis

The fact that the population and therefore the labour supply potential has not decreased – as predicted in 2009 on the basis of the last population projection – is being attributed solely to migration in recent years. Between 2010 and 2013, on balance 1.2 million more persons migrated to Germany than emigrated, of whom around one million were between the age of 18 and 65, an age that is relevant for the apprenticeship and labour market (cf. Table 5). A good 700,000 of them were actually available to the labour market (Vogler-Ludwig et al. 2015: 47f.).

Migration of recent years was mapped out in the 13th Coordinated Population Forecast which was published at the end of April 2015. Even though there was basically no change in the trend of a shrinking

population and in the labour supply potential, the assumptions made in the 12th Coordinated Population Forecast in relation to the upper and lower limits of the labour force as a whole shifted several years into the future (cf. Table 6 and Figure 1).⁴

Table 6: Population of working age (20 to 64) according to the 13th Coordinated Population Forecast (2015)

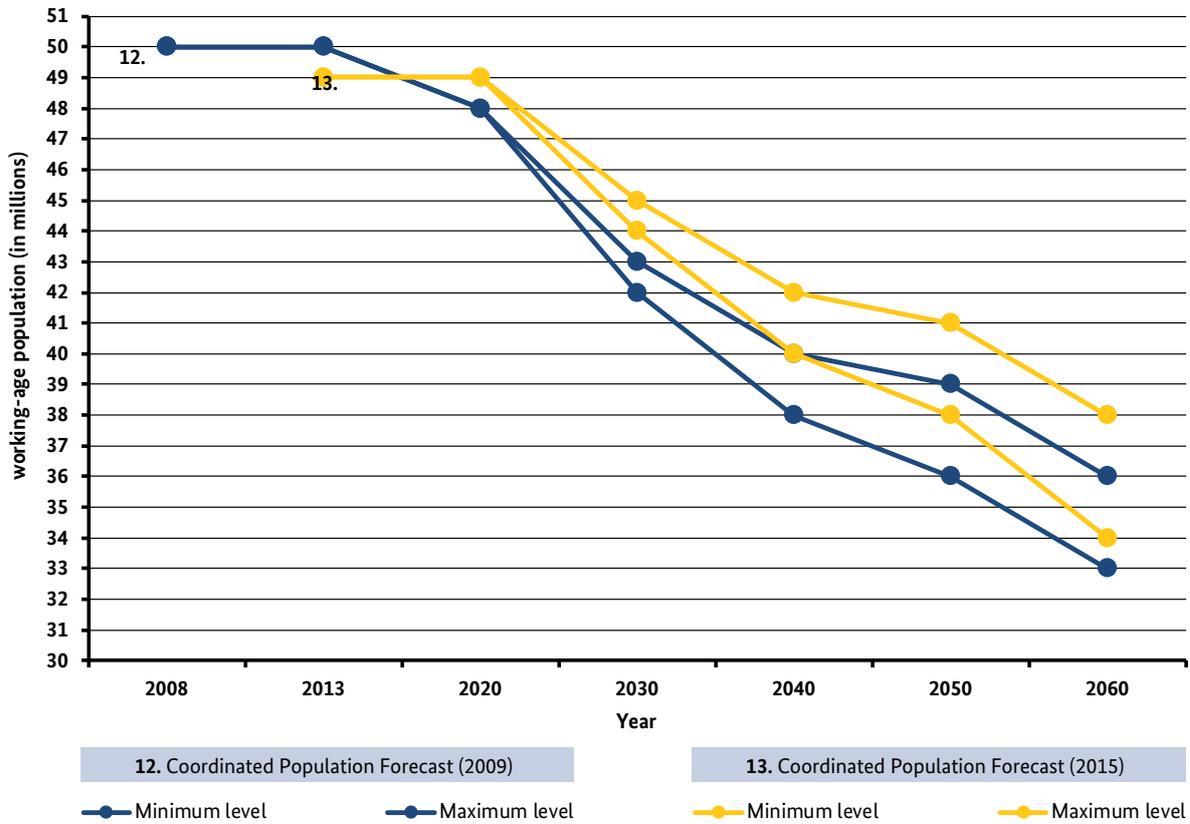
Year	"Medium-aged" population in millions	
	Minimum level	Maximum level
2013	49	49
2020	49	49
2030	44	45
2040	40	42
2050	38	41
2060	34	38

Source: Statistisches Bundesamt 2015

As it is impossible to predict long-term migration figures, this will later lead to methodical uncertainties in identifying actual skilled labour shortages that may arise. The methodical problems invariably associated with future projections also result in different ways of interpretation that have made their way into the public debate about actual or merely perceived skilled labour shortages in Germany.

⁴ Slight adjustments were made to the average life expectancy of newborns and the anticipated number of migrants in the 13th Coordinated Population Forecast.

Figure 1: Anticipated trend in the basic labour supply according to the 12th and 13th Coordinated Population Forecasts



Source: Own research, based on Statistisches Bundesamt 2009/2015

4 Public debate on labour shortages

The topic “skilled labour shortage” has been dominating discussions about the labour market in recent years in view of the demographic trend in Germany and the processes of structural change actually observed or anticipated in some regions. It has been and still is discussed widely and controversially both at scientific and political level, although there is some overlapping in the debate conducted publicly and through the media. While there can be no mention of a general skilled labour shortage in Germany, there are certainly quantifiable skilled labour bottlenecks in some regions and/or industries that are the topic of discussions which are being addressed and communicated in these regions/industries. It is therefore inevitable that the unequivocal, normative, policy-oriented term “skilled labour shortage” is sometimes used as a synonym for the terms “skilled labour bottleneck” or “skilled labour gap”, with the relevant results, meaning that the term “skilled labour shortage” is being used in the wrong context in the public debate and is often exaggerated. The definitions are also unclear. Some people have warned not just of a skilled labour shortage but of a general labour shortage in this context.

Whereas some interest groups such as the Confederation of German Employers’ Associations (Bundesvereinigung der Deutschen Arbeitgeberverbände, BDA), the Federation of German Industries (Bundesverband der Deutschen Industrie, BDI) and indeed research institutions such as the Cologne Institute for Economic Research (Institut der deutschen Wirtschaft Köln e.V., IW Köln) assume or have assumed in the past that there is/was a skilled labour shortage (Koppel/Plünnecke 2009), the Federal Employment Agency, the Institute for Employment Research (Institut für Arbeitsmarkt- und Berufsforschung, IAB), and the German Institute for Employment Research (Deutsches Institut für Wirtschaftsforschung, DIW) have drawn to the conclusion that there currently is no evidence of a general shortage of skilled workers (IAB 2015: 2). In a statement issued about the demand for skilled labour

in Germany in relation to demographic change, the IAB said there had been a decline in the labour supply potential but that this could not automatically be seen as a gap in skilled labour and should not be compared to a general skilled labour shortage (IAB 2013: 6). Although the IAB thinks there could be an increase in skilled labour shortages in the medium to long term, IAB analysts anticipate that “adjustments will be made to labour markets, capital markets and the markets for goods which may lead to a decline in labour demand (IAB 2013: 14). However, no clear front lines between the mentioned institutions exist, which means that also the Cologne Institute for Economic Research, for example, knows and communicates the differences between skilled labour bottlenecks and skilled labour shortages. Opinions which refer to an anticipated “influx of skilled labour” (Brenke 2010) or even to the “myth of skilled labour shortages” (Gaedt 2014) have been few and far between in recent years (and most of them also excluded medical professions). However, the statistical surveys carried out by the Federal Employment Agency conclude that there is a surplus of skilled labour available for some groups of professionals – particularly for humanities scholars and social scientists.

The opinions voiced in the debate vary greatly. This discussion is very much ongoing and the findings cannot be regarded as irrevocable. As such, the ways of interpreting them are based on a range of different assumptions and on different weightings of the basic parameters which will lead to different perspectives in the accompanying scientific and non-scientific observation undertaken by numerous institutions in Germany (cf. Chapters 7.3 and 7.4). Regardless of what results the individual studies and reports achieve and irrespective of the implications possibly and likely steered by the various interest groups, to ensure that there is a steady supply of skilled labour and a further development of it in general is “one of the most pressing social tasks facing Germany”, as it is said in the

progress report on the skilled labour concept adopted by the Federal Government, because: “Skilled workers with different levels of qualifications are needed in all industries in order to maintain social prosperity and to facilitate growth and the competitiveness of German industry” (BMAS 2014). In order to secure a steady supply of skilled labour, the Federal Government is pursuing a strategy that is based on several pillars. This strategy established provisions for reducing chronic unemployment, for providing training and upskilling measures for the domestic labour supply potential associated with it, mobilising women and also older persons who are not participating in gainful employment while at the same time trying to attract qualified migrants, with the field of migration from third countries playing an important role.

5 Labour market policy: legal and definitional framework

5.1 Definitions

There are no general or legally binding definitions for the terms “labour shortage”, “skilled labour shortage” or “skilled labour bottlenecks” in German law. The Act ensuring the Supply and Control of Manpower for Defence Purposes, including the Protection of the Civilian Population (Arbeitssicherstellungsgesetz, ASG) and the Ordinance governing the establishment and coverage of labour requirements in accordance with the Act ensuring the Supply and Control of Manpower for Defence Purposes, including the Protection of the Civilian Population (Verordnung über die Feststellung und Deckung des Arbeitskräftebedarfs nach dem Arbeitssicherstellungsgesetz, ArbSV) contain the most detailed set of rules governing the establishment of labour demand which together regulate the targeted use of the existing labour supply in a state of defence. However, these involve economic considerations that are determined by an exceptional political situation. The following information is therefore based on scholarly definitions that may be controversial.

Labour shortage

Reference is made to labour shortages if and when the demand for labour permanently exceeds the available supply, i.e. when the number of job vacancies employers have to fill exceeds the labour available on the job market. In this context, labour means all gainfully employable and physically capable persons regardless of their qualification level. The last time Germany experienced a general labour shortage “which affected more or less all branches of industry” was in the 1960s and 1970s. This general labour shortage ended with the oil price shock of 1973. Since then, the number of unemployed persons or the more broadly defined underemployment has consistently been higher than the number of job vacancies (BA 2014a: 12).

Skilled labour bottlenecks

Despite the high rates of unemployment, complaints have been made repeatedly in the past few years that some companies and branches of industry are facing

growing difficulties finding suitable skilled labour. Persons who have completed at least two years’ vocational training or obtained an academic degree from a recognised higher education institution are defined as skilled labour. They currently account for around 86 percent of the German workforce. It can be assumed that there is a skilled labour bottleneck when the demand for skilled labour exceeds supply for a brief pre-defined period of time in certain regions or in certain professional groups (BMWi 2014: 4).

Skilled labour shortage

It can be assumed that there is a skilled labour shortage when the demand for skilled labour in certain regions or in certain professional groups permanently exceeds the supply, i.e. when a general skilled labour shortage or a skilled labour shortage specific to certain professional groups can only be established if the market is monitored over extended periods of time using specific indicators.

5.2 Basic principles

Statutory basis

Managing and organising migration to Germany has been one of the most important challenges facing society in recent years, and the legislator has certainly taken this into account (Parusel/Schneider 2010: 20). On the basis of the Act to Control and Restrict Immigration and to Regulate the Residence and Integration of EU Citizens and Foreigners (Gesetz zur Steuerung und Begrenzung der Zuwanderung und zur Regelung des Aufenthalts und der Integration von Unionsbürgern): Immigration Act (Zuwanderungsgesetz) for short, which was adopted on 1 January 2005, the Residence Act (Aufenthaltsgesetz, AufenthG), the Ordinance governing Residence (Aufenthaltsverordnung, AufenthV), the Ordinance on the admission of foreigners for the purpose of taking up employment (Beschäftigungsverordnung, BeschV) and the regulations concerning the recognition of foreign certificates and vocational degrees (like the Professional Quali-

cations Assessment Act (Berufsqualifikationsfeststellungsgesetz, BQFG)) are the most important labour market tools for managing third-country nationals, although the above-mentioned laws and ordinances have been consistently amended in recent years in order to make the labour market more flexible and permeable. The Federal Employment Agency plays a special role in implementing these laws and ordinances (cf. Chapter 6 for details) although the package of measures aimed at attracting qualified labour involves both legal-administrative determinants as well as non-legal factors.

Recognising vocational qualifications as part of the recognition culture

Numerous statutory amendments have been issued in the past few years to make Germany a more attractive location for qualified and highly-qualified migrants from third countries although it is worth noting that there have always been undertones that this was an attempt to counteract the threat of skilled labour shortages. These measures include the so-called “Recognition Act” (Anerkennungsgesetz)⁵ adopted on 1 April 2012, which facilitates the recognition of vocational qualifications obtained abroad and extends the possibilities of integration of skilled labour potential into the labour market (Griesbeck 2014: 181). Since then, third-country nationals have been entitled to have their vocational qualifications checked to establish whether they are equivalent to those of German nationals. In addition to the Recognition Act, the new Ordinance on the admission of foreigners for the purpose of taking up employment which entered into force on 1 July 2013 applies. It no longer makes any distinction between third-country nationals who are already residing in Germany and those who have just entered Germany. This Ordinance has for the first time opened up the German labour market for third-country nationals who have completed at least two years’ vocational training abroad (Section 6 subsection 2 of the Ordinance on the admission of foreigners for the purpose of taking up employment), whereby their qualifications have to be of the same value as the German reference occupations. In addition to simplifying and streamlining administrative processes, the aim of

these statutory measures is to enhance the incentives for skilled foreign workers to seek employment in Germany.

In this context, 26,466 applications for initiating the relevant recognition procedure have been lodged in the years 2012 and 2013. In 2013, 96 percent of the recognition procedures approved the vocational qualifications of the applicants as fully or partly equivalent to German reference occupations. In total, 9,969 vocational qualifications obtained abroad are recognised as fully equivalent in 2013. The vast majority of recognition procedures in Germany involved the area of medical professions in which larger labour bottlenecks have been identified. Out of the application procedures in which recognition was granted, no less than 6,030 were granted to medical doctors and a further 2,403 were granted to other healthcare professionals and nursing care professionals. However, the recognition procedure for vocational qualifications obtained abroad is, in principle, not dependent on the actual skilled labour demand in the respective professional groups and can also be initiated whether or not the foreigners in question hold a residence title. There is no general obligation for third-country nationals to have their vocational qualifications obtained and recognised by the state abroad assessed in Germany. This also depends on whether a regulated profession is involved, although there is no doubt that formal recognition greatly improves their career prospects. However,⁶ the principle of voluntariness does not apply to regulated professions; the same applies to occupations and professions in which labour shortages have been identified. Foreigners working in these occupations and professions must have their qualifications recognised, because this determines whether they are eligible for a residence title which they need to become gainfully employed.

Partners involved in recognising vocational qualifications obtained abroad are the competent Chambers of Industry and Commerce (IHK) which set up their own competence centre which initiates the procedure for determining the equality of vocational and profes-

5 This is the Assessment and Recognition of Foreign Professional Qualifications Act (Gesetz zur Verbesserung der Feststellung und Anerkennung im Ausland erworbener Berufsqualifikationen), an Act amending the Professional Qualifications Assessment Act (BQFG).

6 The respective professional laws apply to regulated professions as in the case of medical doctors, dentists, veterinarians, master craftsmen, psychotherapists, healthcare professionals, nurses, geriatric nurses, midwives, lawyers and notaries. Similar applies to professions that are regulated by the Federal Länder, for instance, teachers and engineers.

sional qualifications. The so-called IHK FOSA (Foreign Skills Approval) is responsible for more than 250 dual IHK training and IHK advanced training occupations. The competent Chambers of Trade (HWK) and Agriculture (LWK) responsible for third-country nationals' future place of work are responsible for training occupations in the handicrafts and in agriculture. In the case of regulated professions, such as medical doctors, the regional authorities of the Federal Länder are responsible for recognising their vocational qualifications. Foreigners filing an application for the equality assessment of their professional qualifications must submit the following documents:

- A tabular overview (in German) of the training courses/university courses completed and of their employment history,
- proof of identity (ID card or passport),
- vocational training certificate, proof of academic degree,
- proof they have the relevant vocational/professional experience,
- proof of other qualifications (advanced training, etc.),
- a declaration stating that they have not previously filed an application for the assessment of equality and
- proof that they are planning to work in Germany.⁷

In principle and if all relevant documents have been submitted, the competent authorities have up to three months to process the applications for the assessment of the equality of vocational and professional qualifications, however, this term may be extended once in justified cases (Section 6 subsection 3 of the BQFG). The average processing time is 59.1 days, however, 80 percent of all initiated recognition procedures are completed within the three-month deadline, half of them even within one month.⁸

7 Comprehensive information about the individual training occupations, on the advisory services available and on the individual steps involved in the recognition process can be found under the following link: <http://www.anerkennung-in-deutschland.de/html/de/index.php> (22 April 2015).

8 The present report on the Recognition Act 2015 can be found at: http://www.bmbf.de/pub/bericht_zum_anerkennungsgesetz_2015.pdf (20. July 2015).

Welcome culture

Since foreigners decision to come to Germany is generally determined by expectations for a better future and by hopes to get the “feeling of being welcome”, a welcome and recognition culture has been created alongside legislative measures. This strategy that was explicitly written into the coalition agreement is intended to assure third-country nationals who are willing to come to Germany and to work here that they are welcome and appreciated which, in turn, is also a prerequisite for the successful attraction of investors, entrepreneurs and skilled workers. There is consensus among all the parties represented in the German Bundestag that migration is necessary to main prosperity and the supply of skilled labour, even though the ideas concerning the scale of migration and the statutory implementation of migration measures differ from party to party. The coalition agreement concluded by the government parties makes provision for strengthening the “pre-integration” of new migrants in their countries of origin. These already existing measures include, for instance, providing information about German language courses, possibilities created under the Residence Act to enrol at university or a third level educational institution, becoming gainfully employed and on the recognition of vocational and professional qualifications in Germany (CDU/CSU/SPD 2013: 75f.). The creation of the Web portal “Make it in Germany” had already heeded this request in 2012. Medium and long-term considerations of this strategy take into account that migration helps to generate economic growth, to boost employment and at the very least to stabilise and safeguard the basic supply of labour.

5.3 Residence regulations

General legal conditions

Whereas EU nationals⁹, nationals of Switzerland and nationals of the EEA countries Iceland, Liechtenstein and Norway have freedom of establishment in EU countries and are equal to nationals of these countries in terms of employment, third-country nationals need a relevant residence title to become gainfully employed. In principle, the requirements set forth in the

9 Since 1 January 2014, nationals of Bulgaria and Romania have also been subject to freedom of movement for workers. Nationals of Croatia are currently subject to transitional arrangements that limit access to the German labour market.

Residence Act apply to all foreign workers who want to work in an occupation or profession in Germany for which a labour shortage or labour bottleneck has been identified. In addition to the national visa which can only be used for certain pre-defined residence purposes, there are basically four different residence titles under German law that allow third-country nationals to become gainfully employed:

- EU Blue Card,
- Residence permit,
- Settlement permit,
- EU long-term residence permit.

Recruitment strategy and provisions under the Residence Act

On the basis of the five above-mentioned pathways for securing basic employment, the strategy adopted by the Federal Government is aimed at attracting qualified and highly-qualified migrants. They include persons who have university or college degrees, who can furnish proof of at least two years of vocational experience or who are in possession of comparable qualifications. Whereas the Residence Act tries to distinguish between highly-qualified foreigners (Sections 18b, 18c, 19, 19a and 20 of the Residence Act) and qualified skilled workers (Section 18 subsection 4 and Section 18a of the Residence Act) (Mayer 2013: 13), the final analysis fails to make a clear distinction between the two. The term “skilled workers” is still used to a much greater extent in the political debate as a synonym for both groups and includes “skilled workers of tomorrow”, who are currently undergoing training in the long-term outlook given that they are set to become more and more important for securing the supply of skilled workers. Sections 16 and 17 of the Residence Act contain special provisions for this group of students and apprentices. The so-called “positive list” drawn up by the Federal Employment Agency is gaining momentum for occupations and professions in which labour shortages or labour bottlenecks have been identified, since migrants from third-countries may be subject to special admission conditions (cf. Chapter 6.4).

Students and apprentices

Section 16 and Section 17 of the Residence Act regulate, inter alia, the conditions under which a residence permit may be issued for the purposes of studying at a state or state-recognised university or a comparable

educational institution (Section 16) and for the purpose of basic and advanced industrial training (Section 17), although each residence permit granted is combined with a limited work permit. Pursuant to subsection 3, students residing in Germany pursuant to Section 16 of the Residence Act shall be entitled to take up employment, in total no more than 120 days or 240 half-days per year. Pursuant to Section 17, where such training serves to acquire vocational qualifications, the residence permit shall authorise its holder to work up to 10 hours per week in jobs which need not be related to such vocational training. Members of both groups can be permitted to continue residing in Germany for the purpose of seeking a job commensurate with their qualifications after successful completion of a course of study or such vocational training. The residence permit may be extended up to 18 months for students pursuant to Section 16 subsection 4 of the Residence Act. Pursuant to Section 17 subsection 3 of the Residence Act, after successful completion of such vocational training, the residence permit may be extended up to one year. The residence permit shall entitle the holder to pursue an economic activity in this period. If there is an apparent link between the course of study or training and the future activity, foreigners in these two residence categories can decide to set up their own business (Vollmer 2015). The aim of these regulations is to attract qualified and at least very young people and the skills they have learned (in part or in full) in Germany for the German labour market and to make effective use of these skills.

Table 7: Third-country nationals, who were granted a residence permit in 2014 for the purposes of training (Section 16 and Section 17 of the Residence Act) broken down by the most frequent nationalities

Nationality	Total
China	23,175
India	7,152
Unites States	5,955
Russian Federation	5,780
Brazil	5,202
Republic of Korea	4,832
Ukraine	3,539
Cameroon	3,405
Turkey	3,076
Iran	2,967
Other third-country nationals	48,083
Total	113,166

Source: Central Register of Foreign Nationals, BAMF 2015

Table 8: Third-country nationals who were granted a residence permit for the purposes of training 2014

	Pursuant to Section 16 subsections 1 and 6 of the Residence Act (study purposes)	Pursuant to Section 16 subsection 1a of the Residence Act (applying to a course of study)	Pursuant to Section 16 subsection 4 of the Residence Act (seeking employment after successful completion of studies)	Pursuant to Section 16 subsection 5 of the Residence Act (attending language courses, school education)	Pursuant to Section 17 subsection 1 of the Residence Act (basic and advanced industrial training)	Pursuant to Section 16 subsection 5b and 17 subsection 3 of the Residence Act (seeking employment after successful completion of studies)	Total
Total number of residence permits granted in 2014	94,902	315	4,990	6,914	5,981	64	113,166
Entry in 2014	40,972	209	115	5,189	3,274	11	49,770
Entry prior to 2014	53,930	106	4,875	1,725	2,707	53	63,396

Source: Central Register of Foreign Nationals, BAMF 2015

In 2014, 4,990 residence permits were issued to third-country nationals for the purposes of seeking employment pursuant to Section 16 subsection 4 of the Residence Act (cf. Table 8). At the end of 2014, a total of 7,120 persons with this residence title were registered with the Central Register of Foreign Nationals. There were much fewer apprentices and foreigners who had completed vocational training in recognised training occupations in Germany than foreign students in the period under review, even though more than 5,000 mostly young persons were granted a residence title for training purposes pursuant to Section 17 subsection 1 of the Residence Act. Whereas endeavours to enhance the attractiveness of Germany as a place to reside focused primarily on the category of students in recent years, over the course of the most recent years focus has shifted also to non-academic training occupations. Therefore, people complain that although Germany has become more attractive to students in the past few years, this development does not apply to the same extent to upcoming skilled workers in training occupations (BMAS 2014b: 21). Notwithstanding this, this group is considered to offer potential for safeguarding the supply of skilled labour which needs to be leveraged more effectively (cf. Table 8).

Migration of skilled labour

The term “skilled workers” tends to be used colloquially and to be overgeneralised in the political debate, i.e. it tends not to make an explicit distinction between persons who have completed higher education courses and those who have completed vocational training. Yet

the German Residence Act recognises legally different “migration channels” for the different levels of qualifications. “The admission of foreign employees shall be geared to the requirements of the German economy, according due consideration to the labour market situation and the need to combat unemployment effectively” (Section 18 subsection 1 of the Residence Act). In the case of identified labour market bottlenecks and the professional categories on the positive list of the Federal Employment Agency (cf. Chapter 6.4), there is reason to assume that it is in the interest of Germany as a business location to fill job vacancies with qualified foreign workers. The Federal Employment Agency plays a special role in this process. Section 18 subsection 2 of the Residence Act says that “a foreigner may be granted a residence title for the purposes of taking up employment if the Federal Employment Agency has granted approval in accordance with Section 39 or if a statutory provision in accordance with Section 42 or an inter-governmental agreement stipulates that such employment may be taken up without approval from the Federal Employment Agency”.

Qualified workers

Section 18 subsection 4 of the Residence Act contains the legal definition for the admission of third-country nationals with vocational qualifications that is still the most important. It says:

“Residence title for the purpose of taking up employment pursuant to subsection 2 which requires a vocational qualification may only be issued for

employment in an occupational group which has been approved by virtue of a statutory instrument in accordance with Section 42. In justified individual cases, a residence permit may be issued for the purpose of taking up employment when there is a public interest, and in particular a regional interest or an interest relating to the economy or the labour market.”

The passage cited in sentence 2 only belongs to instances and single cases which are not accounted in the Ordinance on the admission of foreigners for the purpose of taking up employment. This applies, for example, when the recruitment of an employee from a third country is the prerequisite for the creation of further jobs. Whether a special regional, economical or an interest relating to the labour market exists, may be influenced by, for instance, the results of the regional labour shortage analysis conducted by the Federal Employment Agency (cf. details in Chapter 6.3), though the labour shortage analysis must not be confused with the positive list. For occupations featuring on the positive list of the Federal Employment Agency, the compulsory priority examination is waived if the conditions set forth in Section 6 subsection 2 sentence 1 (2) of the Ordinance on the admission of foreigners for the purpose of taking up employment are met. This does not apply to the same extent to occupations featured only in the labour shortage analyses unless other provisions apply. The prerequisite under which a foreigner may be granted a residence title for the purpose of taking up employment pursuant to Section 18 subsection 2 and 4 of the Residence Act is in any case that a concrete job offer exists (pursuant to Section 18 subsection 5 of the Residence Act). This also applies to highly-qualified third-country nationals applying for a residence permit pursuant to Section 19a of the Residence Act (EU Blue Card).

Employment for qualified foreigners whose deportation has been suspended

The group of foreigners whose deportation has been suspended represents a group of migrants in Germany that has garnered very little attention so far. Since 1 January 2009 Section 18a of the Residence Act regulates the conditions under which they can change their statuses from foreign nationals legally obliged to leave the country into statuses with a long-term perspective to residing in Germany. This group also offers untapped potential that could certainly be leveraged to counteract (potential) skilled labour shortages. Since

a few years people starting, for instance, an apprenticeship can get the permission for the purpose of gainful employment without the priority check referring to Section 39 subsection 2 of the Residence Act. However, administrative obstacles, for example in the area of recognising vocational qualifications, and the lack of skills have hampered their integration into the labour market up to now. This is reflected in the low statistics of the year 2014 (cf. Table 9). The comparative figures for 2013 are also in the low two-digit range (BAMF 2014: 11), even though there were 95,171 foreigners whose deportation has been suspended residing in Germany the same year (BAMF 2015: 159).

Table 9: Third-country nationals whose deportation has been suspended who were granted a residence permit for the purposes of taking up gainful employment in 2014

	Pursuant to Section 18a of the Residence Act (residence permit for the purpose of employment for qualified foreigners whose deportation has been suspended)
Total number of residence permits granted	61
Entry in 2014	8
Entry prior to 2014	53

Source: Central Register of Foreign Nationals 2015

On 11 November 2014, the Second Ordinance amending the Ordinance on the admission of foreigners for the purpose of taking up employment entered into force, facilitating the integration of qualified foreigners whose deportation has been suspended into the labour market. Foreigners whose deportation has been suspended are therefore permitted to become gainfully employed provided the Federal Employment Agency issues approval to them taking up employment (Section 32 subsection 1 of the Ordinance on the admission of foreigners for the purpose of taking up employment). However, the approval of the Federal Employment Agency has meanwhile been fully waived for some occupational and professional groups:

- University and college graduates in professions subject to labour shortages who fulfil the requirements for an EU Blue Card or
- skilled workers who have a recognised qualification in an occupation subject to labour shortages according to the positive list of the Federal Employment Agency or who are par-

participating in a measure aimed at the recognition of vocational qualifications.

A priority review is also waived for persons who have been residing in Germany without interruption for 15 months, who are in possession of a residence permit, whose deportation has either been suspended or who have a work permit (Section 32 subsection 5 of the Ordinance on the admission of foreigners for the purpose of taking up employment). Initially, the provision has been limited to a period of three years. The Federal Government will decide whether or not to extend this statutory measure before the three years have elapsed. By contrast, foreigners who moved to Germany in order to draw social security benefits or who themselves created an obstacle to deportation or are responsible for an obstacle to deportation are, in principle, prohibited from taking up gainful employment (Section 33 subsection 1 of the Ordinance on the admission of foreigners for the purpose of taking up employment).

Residence permit enabling qualified workers to seek employment

Section 18c of the Residence Act is a comparatively new tool for counteracting (potential) skilled labour shortages. The provision will enable third-country nationals to seek employment in Germany. They are not required to have a concrete job offer when they apply for a residence title although Section 18c of the Residence Act marks a departure from a principle that has been in place in the foreigners legislation in the field of labour migration for several decades. Although the residence title itself does not permit foreigners to become gainfully employed, it does allow foreigners holding a residence permit to seek a job for a period of up to six months. This means the approval of the Federal Employment Agency is not required for this residence title. Applicants for a residence permit pursuant to Section 18c of the Residence Act must prove that their subsistence is secure. If this condition is met, qualified professionals can also organise the comprehensive preparatory work and file the necessary applications for self-employment in Germany. However, in order to be eligible for a residence permit, foreigners must have a German or foreign university or college degree which is recognised or otherwise comparable to a German equivalent. Once a foreigner has found a job, he or she must apply to the local foreigners authorities for a residence title that will allow them to take up

gainful employment under the respective requirements. In the meantime, a departure is not necessary.

EU Blue Card

The EU Blue Card is an important legal tool used to counteract (potential) skilled labour shortages. There has been a very positive trend in the number of foreigners who have been issued with an EU Blue Card since it was introduced, even though a large number of foreigners currently in possession of this card was residing in Germany on the basis of another residence title before they applied for an EU Blue Card. The conditions under which foreigners are eligible for the EU Blue Card are regulated in Section 19a of the Residence Act. It states that a foreigner may be issued with an EU Blue Card if he or she “holds a German or a foreign higher education qualification which is recognised or otherwise comparable to a German higher education qualification”, if the Federal Employment Agency has given its approval and if he receives a salary for the year in question that is equal to or exceeds that stipulated by the statutory instrument (Section 19a subsection 1-3 of the Residence Act). The minimum gross salary for the year 2015 in routine cases is EUR 48,400. If this salary level is reached or exceeded, foreigners will get the approval of the Federal Employment Agency without a further priority check. If this is not the case, the compulsory priority examination will be carried out by the Federal Employment Agency in all occupations not subject to labour shortages. A lower income limit applies to occupations subject to labour shortages which “must amount to at least 53 percent of the annual contribution assessment ceiling in the general pension insurance (Section 2 subsection 2 Ordinance on the admission of foreigners for the purpose of taking up employment). It amounts to EUR 37,752 in 2015. Once this salary limit is reached, foreigners holding a German higher education qualification need the approval of the Federal Employment Agency. Foreigners holding a foreign higher education qualification will continue to require the approval of the Federal Employment Agency pursuant to Section 2 subsection 2 of the Ordinance on the admission of foreigners for the purpose of taking up employment although it will be granted without a priority examination. However, in these cases, an examination of working conditions will be carried out before an EU Blue Card is issued, in order to ensure that they are comparable to the working conditions for German employees. The minimum salary limit is aligned to the minimum limit of the Directive.

The EU Blue Card shall be issued for a maximum period of four years from the date of initial issue. Where the duration of the employment contract is less than four years, the EU Blue Card shall be issued or extended for the period covering the employment contract plus three months (Section 19a subsection 3 of the Residence Act), if the contract has the remaining duration. At the same time, the conditions to get a permanent residence permit are favourable for holders of an EU Blue Card. Unlike regular cases (pursuant to Section 9 of the Residence Act), holders of a Blue Card are to be issued with a settlement permit, if they have held a position of employment for at least 33 months and have made mandatory or voluntary contributions to the statutory pension insurance scheme for that period. The period referred to in sentence 1 shall be reduced to 21 months if the foreigner has a sufficient command of the German language (Section 19a subsection 6 of the Residence Act). This measure under the Residence Act is intended to encourage qualified and highly-qualified foreigners to continue residing in Germany in the medium and long term and hence to ensure there is an adequate supply of skilled labour.

Researchers

Since the economic success of any country depends heavily on scientific and technical innovations and advancements, special provisions apply to researchers. In Section 20 subsection 1 of the Residence Act, it says that a foreigner shall be granted a residence permit for research purposes where “he or she has concluded an effective admission agreement for the purpose of carrying out a research project with a research establishment which is recognised for implementation

of the special admission procedure for researchers in the federal territory” and “the recognised research establishment has undertaken in writing to bear the costs accruing to public bodies up to six months after termination of the admission agreement

- a) the foreigner’s subsistence during an unlawful stay in a Member State of the European Union and
- b) a deportation of the foreigner”.

However, the requirement pursuant to Subsection 1, no. 2 should be waived where the activities of the research establishment are financed primarily from public funds or where there is a special public interest in the research project. The residence permit shall be issued for a period of at least one year – where the research project is completed in a shorter period the term of the residence permit shall be limited to the duration of the research project (Section 20 subsection 4 of the Residence Act). The aim of this statutory regulation is to secure Germany’s attractiveness as a business location in the medium to long term. Table 10 provides an overall view of the migrant groups that are the most important for ensuring there is a steady supply of skilled labour.

In 2014, a total of 64,518 persons were granted a residence permit for the purposes of gainful employment in Germany. This counts 1,601 persons or 2.5 percent more than in 2013 although it must be taken into account that nationals from Croatia have not been included in these statistics since Croatia joined the EU on 1 July 2013 (BAMF 2015: 16).

Table 10: Third-country nationals whose deportation has been suspended and who were granted a resident permit for the purpose of taking up gainful employment in 2014

	Pursuant to Section 18 subsection 3 of the Residence Act (no qualified employment)	Pursuant to Section 18 subsection 4 of the Residence Act (qualified employment)	Pursuant to Section 18a of the Residence Act (employment for qualified foreigners whose deportation has been suspended)	Pursuant to Section 18c of the Residence Act (Residence permit for qualified skilled workers seeking employment)	Pursuant to Section 19a of the Residence Act in conjunction with Section 2 of the Ordinance on the admission of foreigners for the purpose of taking up employment (EU blue card)	Pursuant to Section 20 of the Residence Act (Researchers)	Pursuant to Section 21 subsection 1, 2 and 2a of the Residence Act (Self-employment)	Pursuant to Section 21 subsection 5 of the Residence Act (Self-employment)	Total number of residence permits granted for the purposes of gainful employment / EU blue card
Total number of residence permits granted in 2014	12,526	34,630	61	186	11,848	694	1,484	3,089	64,518
Entry in 2014	8,290	16,181	8	93	4,673	344	486	945	31,020
Entry prior to 2014	4,236	18,449	53	93	7,175	350	998	2,144	33,498

Source: Central Register of Foreign Nationals 2015

6 The role of the Federal Employment Agency

6.1 General conditions

The admission of foreign employees shall be geared to the requirements of the German economy, in consideration of the labour market situation and the need to combat unemployment effectively (Section 18 subsection 1 of the Residence Act). As such, the Federal Employment Agency plays an important role in identifying labour shortages and in admitting third-country nationals to the German labour market. Its role is regulated in Sections 39 to 42 of the Residence Act. Section 39 subsection 1 of the Residence Act says: “A residence title which permits a foreigner to take up employment may only be granted with the approval of the Federal Employment Agency, in the absence of any provisions to the contrary in statutory instruments.” Such approval may also be granted if laid down in intergovernmental agreements. In principle, “The Federal Employment Agency may approve the granting of a residence permit to take up employment pursuant to Section 18 or of an EU Blue Card pursuant to Section 19a if

1. a) the employment of foreigners does not result in any adverse consequences for the labour market, in particular with regard to the employment structure, the regions and the branches of the economy, and
 - b) no German workers, foreigners who possess the same legal status as German workers with regard to the right to take up employment or other foreigners who are entitled to preferential access to the labour market under the law of the European Union are available for the type of employment concerned or
2. it has established, via investigations for individual occupational groups or for individual industries in accordance with sentence 1, no. 1, letters a and b, that filling the vacancies with foreign applicants is

justifiable in terms of labour market policy and integration aspects,

and the foreigner is not employed on terms less favourable than apply to comparable German workers” (Section 39 subsection 2 of the Residence Act). Since priority is still being given to reducing existing unemployment, the Federal Employment Agency generally carries out an examination of priority when filling a job vacancy with a third-country national. This is part of the approval system and detects whether job vacancies can be filled by unemployed German nationals, EU nationals or nationals of other EEA countries or by third-country nationals residing in Germany who already hold a work permit. If a job vacancy is to be filled by a third-country national, the employer is obliged to file a placement request, i.e. he is obliged to notify the local labour authorities. The local labour authorities publish the job vacancy on their job portal which ensures the placement services are transparent. If it is not possible to fill a job vacancy with a German national, the Federal Employment Agency may approve the issue of a residence permit for the purposes of employment.

The International Placement Services (Zentrale Auslands- und Fachvermittlung, ZAV) which is part of the Federal Employment Agency together with the local labour authorities is responsible for the procedure governing access to the labour market. This review procedure applies to third-country nationals who have just entered Germany and to persons who are already residing in Germany and are registered with the foreigners authorities responsible for their place of residence. In order to obtain the approval of the Federal Employment Agency, the following conditions must be met:

1. The statutory framework must allow access to the German labour market,
2. the applicant must have a concrete job offer,

3. there must be no other workers available for the actual job who have priority and
4. the working conditions must be comparable to those of German employees.

This examination procedure involves the Federal Employment Agency and the foreigners authorities responsible for the third-country national's place of residence or the German mission abroad, although it must be examined in each individual case whether the approval of the Federal Employment Agency is needed in the first place. There are meanwhile numerous occupations, professional groups and types of employment for which the approval of the Federal Employment Agency is not needed. This does not apply to foreign graduates of German universities and colleges or to EU Blue Card-holders (pursuant to Section 19a of the Residence Act in conjunction with Section 2 subsection 1 (2) of the Ordinance on the admission of foreigners for the purpose of taking up employment), but, for instance, also to teachers, research assistants and guest scholars residing in Germany on the basis of Section 20 of the Residence Act. Details on whether the approval of the Federal Employment Agency is required are regulated in the Ordinance on the admission of foreigners for the purpose of taking up employment.

If the approval of the Federal Employment Agency is needed, it is limited to the duration of the employment in the case of limited employment contracts, to three years maximum. There are, however, some exceptions, for instance, if bilateral agreements envisaging different periods have been agreed. In these cases too, approval is only issued for the envisaged duration of the employment contract which does not mean that the company can extend the contract at a later date. If the Federal Employment Agency issues approval, the German mission abroad or the foreigners authorities responsible for the third-country national's place of residence must incorporate the defined conditions into the residence title (the duration of the contract, the type of employment, the company the third-country national is taking up employment with, provisions governing the region of employment and on working hours) (BA 2014b: 19).

Meanwhile, the Federal Employment Agency has also issued a positive list for occupations in which there is a labour bottleneck or labour shortage. It is updated

biannually and on an ongoing basis and defines the professional groups and minimum level of qualifications required (skilled worker, specialist, etc.) (cf. Chapter 6.2.2).¹⁰

6.2 Identification of labour and skill shortages: Basis of data

6.2.1 IAB survey on national job vacancies

In addition to the statistics on registered vacancies and registered unemployed persons, the Federal Employment Agency uses the survey on national job vacancies carried out by the Institute for Employment Research (IAB) for its analysis on skilled labour bottlenecks. The survey is used as a complementary source (BA 2014a: 4). The Institute for Employment Research in Nuremberg has been conducting a survey on the aggregate national supply of labour every year since 1989. It involves a multi-phase survey of companies that enables conclusions to be drawn about the scope and causes of skilled labour demand and on the aggregate national labour demand. Using this analytical and observation tool, it is not just possible to identify the industries that have been hit particularly hard by the recent economic crisis but also to document that German companies have managed, by and large, to hold onto their staff unlike comparable crises in the past and unlike some other European countries.

Survey methodology

The survey covers all companies and administrative agencies that have at least one employee who is liable for compulsory social-insurance payments. A disproportionate, stratified, random sample of around 75,000 companies and administrations is drawn from this survey population once a year and is broken down into 28 sectors of the economy, eight categories of company sizes and the 16 Federal Länder. In the fourth quarter of every year, all companies and administra-

10 cf. the positive list pursuant to Section 6 subsection 2 sentence 1 (2) of the Ordinance on the admission of foreigners for the purpose of taking up employment: Migration in training occupations, in: http://www.arbeitsagentur.de/web/wcm/idc/groups/public/documents/webdatei/mdaw/mta4/~edisp/l6019022dstbai447048.pdf?_ba.sid=L6019022DSTFederal+Employment+AgencyI447051 (29 March 2015).

tions involved in this random check receive a letter containing a questionnaire¹¹, asking them to provide details on the employment structure, the current number of employees and any changes year-on-year, expectations regarding employment trends and – in the event that they are planning to hire new staff – on the level of qualifications they would ideally like them to have. In the second stage of the interview procedure, brief telephone interviews are conducted with the companies and administrations in the first, second and third quarter in order to update developments in the demand for labour on an ongoing basis. This survey combined with other economic indicators can shed light on companies' business and employment expectations. This ultimately enables information to be extrapolated to the economy as a whole, providing a representative picture of the labour market situation in Germany on the one hand and enabling conclusions to be drawn on regional and industry-specific differences in employment trends and the demand for skilled labour on the other.

6.2.2 Surveys conducted by the Federal Statistical Office

Wage trends

In addition to the survey on national job vacancies carried out by the Institute for Employment Research, calculations on skilled labour shortages are based on data collected by the Federal Statistical Office. This data includes, for instance, figures on wage trends that are recorded on an ongoing basis and are published in quarterly and annual reports, although the data gathered here not only enables conclusions to be drawn on wage trends in the individual occupational groups but also in the defined professional groups (cf. Box 1). In the annual reports of the Federal Statistical Office, a distinction is made between the size of the company and whether their employees are tied to a collective wage agreement, covering not just the regular average salaries in the respective industries but at the same time financial special effects such as one-off payments and bonuses. By annual comparison, salary discrepancies upwards could shed light on a positive economic climate in the industry and on the economy as a whole

¹¹ The complete questionnaire on the survey carried out by the Institute for Employment Research can be viewed under the following link: http://doku.iab.de/fragebogen/EGS_Papier_Fragebogen_IV_2012.pdf (30 April 2015).

and may therefore also be an initial indicator that employers could be forced to offer financial incentives in order to retain qualified staff at the respective company because they fear they would be no longer be able to compensate for people leaving the workforce or to fill job vacancies within the desired timeframe. This applies in particular to the higher remuneration groups in which formal and actual qualifications frequently give employees more leverage in salary negotiations. When seen in isolation, wage trends do not provide any indication as to whether or not actual skilled labour shortages exist in an industry, as companies with a full book of orders and/or higher collective agreements in the respective industries can afford higher wages and salaries even though the number of unemployed persons in those industries may be comparatively high. Although the statistics for 2014 frequently show wage increases in real terms, no sharp wage and salary increases in specific industries indicating there might be skilled labour shortages were observed (Statistisches Bundesamt 2015). Wage and salary trends are therefore just one indicator of many that are taken into account in the skilled labour analysis conducted by the Federal Employment Agency.

Box 1

Remuneration groups (1-5)

- 1 – Employees in senior positions who have supervisory and planning powers or employees who perform supervisory and planning tasks in larger management areas (e.g. heads of department). Tasks are carried out independently and require comprehensive commercial or technical expertise generally acquired in a university or college education.
- 2 – Employees entrusted with difficult and complex tasks which generally require vocational qualifications and several years' vocational experience as well as special expertise, or employees who perform these tasks in smaller areas of responsibility (e.g. foremen, master craftsmen, etc.). Tasks which can be performed independently for the most part.
- 3 – Employees entrusted with difficult, technical tasks that generally require vocational qualifications sometimes combined with vocational experience.
- 4 – Semi-skilled employees who perform mainly simple tasks not requiring any vocational training but who need special knowledge and skills for industry-specific tasks.
- 5 – Unskilled employees entrusted with simple tasks that can be performed based on diagrams, not requiring any vocational training.

Number and structure of employed persons

In addition to recording the trends in wages and salaries in gross and real terms, the Federal Statistical Office also records the number of employed persons that can be broken down into their countries of origins, allowing a distinction to be made between EU nationals and third-country nationals. Furthermore, it gathers data on the structure of the basic supply of labour. This data can be used, for instance, to shed light on the age structure of employees and on the number of employees expected to leave the workforce in the next few years.

Number of graduates

University graduates and persons who have vocational qualifications become important in this context. The Federal Statistical Agency records both the number of students enrolled at universities and third level colleges and the most recent university examinations passed (Statistisches Bundesamt 2014) as well as the number of training contracts completed and the number of trainees who passed vocational exams as this enables, for instance, conclusions to be drawn to what extent young and upcoming skilled workers can compensate for the loss of older employees leaving companies because they have reached retirement age. If the positive economic climate and cyclical trend continues, the demographic trend in Germany in the next few years suggests there will be an increase in skilled labour shortages, since the number of older persons retiring from the workforce will be higher than the number of university graduates and persons with vocational qualifications joining the workforce. This indicator also highlights uncertainties that are difficult to record methodically as employees leaving a company when they reach retirement age may not automatically need to be replaced. Rationalisation and automation processes may render it unnecessary to hire new staff or technical innovations may lead to a change or reorientation of job profiles or qualification requirements. Any such difficulties involved in gathering data are systematically taken into account in the skilled labour shortage analyses conducted by the Federal Employment Agency.

6.3 Skilled labour shortage analysis

As politicians, companies and society need an objective assessment of the labour market, the Federal Employment Agency carries out a survey of the skilled

labour situation in Germany every six months and publishes it within the framework of labour market coverage in the so-called “Skilled labour shortage analysis”. This publication outlines not just the demand for skilled labour in specific occupational groups and highlights the level of qualifications needed, it also sheds light on their regional distribution. The skilled labour shortage analysis is supplemented by the analytical report issued by the Federal Employment Agency which covers new job vacancies and job vacancies that have been filled in the individual months under review, processing them accordingly.¹² The skilled labour shortage analysis is based on statistics collected by the Federal Employment Agency and takes the job vacancies registered and the number of registered unemployed persons into account some of whom are to be treated as available skilled labour.

However, it is not possible to include all available skilled workers fully when calculating the demand for skilled labour. This applies, for instance, to university and college graduates and persons who have completed vocational training that are difficult to record in statistics as they involve a time window between the completion of apprenticeship and the commencement of employment. It also applies to persons who return to the labour market from the hidden reserves and to part-time workers who wish to extend their working hours and employment (BA 2014c: 5). As such, the skilled labour shortage analysis conducted by the Federal Employment Agency merely applies to the current situation, it is not a projection of future trends and does not quantify demand in absolute figures. The informative value of the analysis is also limited by the textbook assumption that all registered unemployed persons are fully mobile in geographical terms. This is not accurate in reality considering the large number of individual mobility obstacles people may face. It is not possible to make any statements about the attractiveness of employers either, or about the differences between job profiles and applicant profiles as they are

¹² However, the periods reviewed in the monthly statistics are too short to make any statements about actual labour market shortages in individual occupations or professional groups. Detailed information about the individual monthly reviews can be accessed under the following link: <https://statistik.arbeitsagentur.de/Navigation/Statistik/Statistische-Analysen/Analytikreports/Zentral/Monatliche-Analytikreports/Analyse-der-gemeldeten-Arbeitsstellen-nach-Berufen-Engpassanalyse-nav.html> (28 April 2015).

not subject to any formal training criteria. One reason, for instance, is that they require special vocational experience that is not widely available but which only some individuals have to offer. “The extent to which labour shortages exist can vary between the perspective of the employer and the job seeker. They may also deviate from the results of the analysis carried out by the Federal Employment Agency” (BA 2014c: 5f.).

Despite the difficulty involved in recording these uncertainties methodically, it is possible to make some statements on skilled labour shortages in certain occupations and professional groups. To this end, the ratio between unemployment and job vacancies is combined with the length of time it takes to fill job vacancies registered with the labour authorities. They can be broken down into the particular Federal Länder (cf. Chapter 6.3). The Federal Employment Agency bases its analysis on additional parameters and data records including the above-mentioned job vacancy survey carried out by the Institute for Employment Research (cf. Chapter 6.2.1), the employment statistics gathered by the Federal Statistical Office, the age structure of employees which is bound to lead to major changes in the German labour market in the medium term in view of demographic trends, the wage and salary trend as well as the number of university graduates and skilled workers who have successfully completed vocational training (BA 2014c: 6).

Key indicator: Vacancy time

However, each individual indicator involves numerous weaknesses and uncertainties, which is why they need to be weighed up carefully to draw conclusions about the skilled labour situation in Germany from the findings. The existence of job vacancies alone, for instance, does not necessarily indicate that there is a skilled labour shortage, not even if the number of skilled workers available exceeds the number of unemployed persons. In actual fact, the average workforce is determined by a time and quantity factor, with the time factor lending more informative value to the quantity factor. The time factor is therefore of paramount importance for the actual labour shortage analysis but only from the time the job vacancy needs to be filled,¹³ because “employment opportunities are

13 The time between when the Federal Employment Agency is notified of a job vacancy and the time companies would like the job vacancy to be filled is referred to as the average “lead time”.

not seized during the time job vacancies are open and added value is lost” (BA 2014a: 13). The Federal Employment Agency analysts only refer to actual shortages if the job vacancy cannot be filled at all or if it is filled long after it was supposed to be filled. It therefore needs to be taken into consideration that even poor working conditions in companies or overly ambitious expectations in relation to job applicants can lead to significant delays in the placement process.¹⁴ In order to exclude these type of cases when calculating the average length of job vacancies remain open, mention should only be made of labour shortages “if companies are willing to hire applicants on standard market or slightly better wage and working conditions and if it is difficult to fill a job vacancy solely because there are not sufficient suitably trained applicants available” (BA 2014a: 15). It is therefore somewhat difficult in methodical terms to record actual skilled labour shortages. Nonetheless, it is possible to use the length of time jobs remain vacant to identify some occupations and occupational groups in which it is (currently) taking a very long time to fill job vacancies or in which they are not being filled at all.

Recent surveys show that the average length of time jobs remain vacant¹⁵ has increased over the past few years, owing to the favourable economic climate in Germany, although it varies from occupation to occupation and from the level of qualifications to level of qualifications. For the year 2013, the average length of time positions remained vacant was around 63 days for unskilled workers, 80 days for skilled workers and specialists and 85 days for experts. The ratio of job vacancies registered with the Federal Employment Agency was 1:20.7 unemployed unskilled workers, 1:4.2 skilled workers and 1:3.7 unemployed specialists and experts. Depending on the occupation, the length of time it takes to fill a job vacancy varies from 43 days to 107 for skilled workers and from 58 to 105 days for specialists and experts (BA 2014a: 24).

14 The reasons it is proving difficult to fill job vacancies can range from technical and regional incompatibilities, problems with the organisational process involved in filling job vacancies, a lack of information about the job advertiser, the employer or the entire occupational field having a negative image, unattractive working conditions (shift work, limited employment contracts, inability to reconcile work and family life etc.) or unwillingness of the employer to reach a compromise (BA 2014c: 23).

15 In that case the “closed vacancy time” measures the time between the registration and deregistration of a job vacancy by the Federal Employment Agency.

Method of calculation and examination steps of the Federal Employment Agency

The skilled labour shortage analysis is based on pre-defined reference periods in order to create some kind of comparability. Data covering the period between November 2013 and October 2014 was evaluated for the labour shortage analysis published in December 2014 which was compared with the previous year's statistics (November 2012 to October 2013). The same principle applies to the labour bottleneck analysis published in June¹⁶ every year, with the well-known parameters being considered in each study:

- Unemployed persons registered with the Federal Employment Agency,
- new job vacancies and job vacancies liable for compulsory social-insurance payments already registered with the Federal Employment Agency as well as
- the average length of time positions registered with the labour authorities remain open as jobs subject to compulsory social insurance payments (BA 2014c: 24).

The labour demand analysis is based on 144 professional groups recorded by the Federal Employment Agency in 2010, some of which were reclassified in order to paint a more realistic picture of the current professional landscape in Germany. At the same time, the classification of jobs is highly compatible with the ISCO-08 International Standard Classification of Occupations and therefore allows comparisons to be drawn at international level.¹⁷

The stability and relevance criterion is important for the labour shortage analysis. Firstly it only takes occupations into account in which at least 60 departures were recorded over the course of the year (stability criterion). Secondly it does not take any occupations into account in which less than 60 job vacancies were

registered with the Federal Employment Agency over the course of one year. The thereby reduced pre-defined number of occupations sheds initial light on skilled labour shortages when

- the average time it took to fill a job vacancy in the occupation under review was at least 40 percent longer than the length of time it takes to fill a job vacancy in all occupations,
- the ratio between job vacancies registered with the Federal Employment Agency to registered unemployed persons is less than 100:300 and
- the average length of time it takes to fill a job vacancy in the occupation under review has increased by at least 10 days compared to the period under review of the previous year.

In the next step, more detailed criteria apply to the findings gained on individual occupations and occupation categories in order to identify actual skilled labour shortages. These include, inter alia:

- Detailed analysis at the level of qualifications (cf. Box 2),
- proportion of temporary jobs,
- age structure of employees and gainfully employed persons,
- occupation-specific rate of unemployment among employees liable for compulsory social-insurance payments (if available),
- development in the number of persons commencing and persons completing their studies,
- development in the number of persons commencing and persons completing apprenticeships,
- compensation structure,
- affiliated occupations and occupational groups from which skilled workers can be hired, at least in theory.

On the basis of these calculations it is, then, possible to focus on regional considerations although the Federal Employment Agency conducts its own labour shortage analysis for each of the Federal Länder.

When keeping with the findings for Germany as a whole, there is no evidence of a general skilled labour shortage at the level of the Federal Länder. By dividing them into occupational groups, it is, however, possible

¹⁶ The labour shortage analysis of June 2015 is based on data that has been gathered in the period between May 2014 and April 2015 and is compared with the period of the previous year (May 2013 to April 2014).

¹⁷ Information about the classification of occupations (KldB 2010) and on the individual levels of professional qualifications and specialisations is available under the following link on the Federal Employment Agency's website: https://statistik.arbeitsagentur.de/nn_10414/Statistischer-Content/Grundlagen/Klassifikation-der-Berufe/KldB2010/Systematik-Verzeichnisse/Systematik-Verzeichnisse.html (27 April 2015).

to observe the various trends on segments of the labour market classified based on these criteria.

Specific regional features and demand

The existing system consisting of pre-selection and validation used to identify labour shortages is also used in the labour shortage analyses for the individual Federal Länder, although individual criteria are modified and supplemented. This applies, for instance, to the factor “interregional compensation factors” which can be achieved with cross-border commuters, mobility within Germany, although this factor is based on the assumed mobility within Germany. This is relevant for migration-related issues because it is capable, to a certain extent, of shedding light on the extent to which skilled labour shortages can be covered by skilled workers residing in Germany who are available. Basically, the labour shortage analysis distinguishes between a regional description of shortages that appear nationwide and shortages which are confined to the Länder. A skilled labour shortage exists in a Federal Land if

- the length of time it takes to fill a job vacancy at regional level is at least 40 percent above the federal average of all occupations and if the ratio between unemployed persons and job vacancies registered is less than 150:100 or
- if there are fewer unemployed persons than jobs registered.

Signs of skilled labour shortages are considered to exist if

- the length of time it takes to fill a job vacancy is above the federal average of all occupations and if the ratio between unemployed persons and job vacancies registered with the Federal Employment Agency is less than 300:100.

No skilled labour shortage is considered to exist if

- the length of time it takes to fill a job vacancy is below the federal average for all occupations or
- if the ratio between unemployed persons and job vacancies registered with the Federal Employment Agency is more than 300:100 (BA 2014c: 25).

The labour shortage analyses at the level of the Federal Länder enables to draw conclusions on the existence of nationwide labour shortages or a merely limitation to certain regions. Further considerations can be made on this basis for whether mobility within Germany, training, further training and advanced training measures for unemployed persons or migration have the capacity to make up for regional discrepancies between supply and demand (BA 2014c: 26). Table 11 shows the skilled labour shortages in the individual Federal Länder in accordance with the results of the labour shortage analysis of June 2015.

If necessary, the regional analyses can be broken down to the regional level of administrative districts and cities constituting a district in its own right. However, this creates new challenges and problems in relation to recording labour shortage in methodical terms. Firstly, the case numbers are frequently too low to be able to obtain valid data, and secondly cross-border commuters make up for labour shortages to a certain extent which ultimately means that the ratio between unemployed persons and job vacancies is greatly limited.

Regional demand – historical progression

Analyses that are conducted every six months have shown that there can be partial individual labour shortages in the short to long term and indeed some overlapping. Table 12 shows the historical progression

Table 11: Skilled labour demand identified in the labour shortage analyses in the Federal Länder broken down by occupations and levels of qualification (as at: June 2015)

Federal Land	Professional group*	Level of qualifications
Baden-Württemberg	244 Metal construction and welding	3 Specialist
	321 Structural engineering	3 Specialist
	431 Information technology	3 Specialist
Bavaria	321 Structural engineering	3 Specialist
	431 Information technology	3 Specialist
	434 Software development and programming	3 Specialist
Berlin	- -	- -
Brandenburg	244 Metal construction and welding	2 Skilled worker
	817 Non-medical therapeutic professions	3 Specialist
Bremen	244 Metal construction and welding	2 Skilled worker
	343 Supply and waste disposal	2 Skilled worker
Hamburg	252 Automotive engineering, aviation engineering, aerospace engineering, ship building	2 Skilled worker
Hesse	621 Sales (without specialisation)	4 Expert
	723 Tax consultancy	2 Skilled worker
Mecklenburg-Western Pomerania	- -	- -
Lower Saxony	244 Metal construction and welding	2 Skilled worker
	343 Supply and waste disposal	2 Skilled worker
North Rhine-Westphalia	- -	- -
Rhineland-Palatinate	413 Chemical industry	2 Skilled worker
Saarland	- -	- -
Saxony	245 Precision mechanics and tool technology	2 Skilled worker
Saxony-Anhalt	- -	- -
Schleswig-Holstein	252 Automotive engineering, aviation engineering, aerospace engineering, ship building	2 Skilled worker
Thuringia	241 Metal production	2 Skilled worker
	244 Metal construction and welding	2 Skilled worker
	272 Technical drawing, construction, model making	3 Specialist

* Classification based on KldB 2010

Source: Bundesagentur für Arbeit 2014

for occupations in which labour bottlenecks occurred in the analysis period under review. Whereas there has been a steady demand for specialists in the area of automotive engineering, aviation engineering, aerospace technology and ship building (252) in Bavaria, for instance, in recent years and for electrical engineers in Lower Saxony (263), there was no evidence of any regional skilled labour shortages in Mecklenburg-Western Pomerania or Saarland during the same period. Furthermore, any skilled labour bottlenecks that do occur in many Federal Länder tend to be temporary,

such as the shortage of research and development professionals in Baden-Württemberg (271). The labour shortage analysis of June 2015, however, shows that even bottlenecks in occupation groups which could be observed over longer periods are of limited duration. Information about regional labour demand and the professional and residence prospects of third-country nationals eager to work in an area subject to labour shortages is provided not just by the Federal Employment Agency itself but also by its regional directorates.

Table 12: Identified regional labour shortages from a historical perspective (part 1)

Federal Land	Professional group (KldB 2010)	Shortage in accordance with the analysis from			Level of qualifications
		Dec 2013	Jun 2014	Dec 2014	
Baden-Württemberg	242 Metal processing	X	-	-	3 Specialist
	244 Metal construction and welding	-	-	X	3 Specialist
	252 Automotive engineering, aviation engineering, aerospace engineering, ship building	X	X	-	3 Specialist
	263 Electrical engineering	X	X	-	3 Specialist
	271 Technical research and development	-	X	-	4 Expert
	272 Technical drawing, construction and model making	X	-	-	2 Skilled worker
		-	X	-	3 Specialist
	311 Construction planning and supervision, architecture	-	X	X	4 Expert
	321 Structural engineering	X	X	-	2 Skilled worker
		X	X	X	3 Specialist
	322 Civil engineering	-	X	-	2 Skilled worker
	331 Floor layers and tile setters	-	X	-	2 Skilled worker
	333 Plasterers, insulation workers, carpenters, glaziers, shutter makers, blind manufacturers	X	X	-	2 Skilled worker
	432 IT system analysis, application support and IT sales	X	X	-	4 Expert
	434 Software development, programming	X	X	-	3 Specialist
	818 Pharmacists	X	X	-	4 Expert
Bavaria	244 Metal construction workers and welders	-	-	X	3 Specialist
	252 Automotive engineering, aviation engineering, aerospace engineering, ship building	X	X	X	3 Specialist
	263 Electrical engineering	-	X	X	3 Specialist
	272 Technical drawing, construction and model making	X	X	-	3 Specialist
	321 Structural engineering	-	-	X	3 Specialist
		-	X	-	4 Expert
	322 Civil engineering	-	X	-	4 Expert
	331 Floor layers and tile setters	-	X	-	2 Skilled worker
	431 Information technology	-	-	X	3 Specialist
	434 Software development and programming	-	-	X	3 Specialist
511 Technical operation of rail transport, air transport and shipping	X	-	-	2 Skilled worker	
Berlin	432 IT system analysis, application support and IT sales	-	X	X	3 Specialist
	825 Medical engineering, orthopaedics and rehabilitation technology	X	X	-	2 Skilled worker
Brandenburg	242 Metal processing	-	-	X	3 Specialist
	263 Electrical engineering	X	-	-	3 Specialist
	813 Healthcare, nursing, emergency services, midwifery	-	X	-	4 Expert
	817 Non-medical therapeutic professionals	-	X	X	3 Specialist
	825 Medical engineering, orthopaedics and rehabilitation technology	X	-	-	2 Skilled worker
Bremen	242 Metal processing	X	X	-	2 Skilled worker
	244 Metal construction workers and welders	-	X	X	2 Skilled worker
	263 Electrical engineering	-	-	X	3 Specialist
	511 Technical operation of rail transport, air transport and shipping	-	X	-	4 Expert
Hamburg	263 Electrical engineering	-	X	-	3 Specialist

Source: Bundesagentur für Arbeit 2013/2014

Table 12: Identified regional labour shortages from a historical perspective (part 2)

Federal Land	Professional group (KldB 2010)	Shortage in accordance with the analysis from			Level of qualifications
		Dec 2013	Jun 2014	Dec 2014	
Hesse	252 Automotive engineering, aviation engineering, aerospace engineering, ship building	X	-	-	3 Specialist
	263 Electrical engineering	-	X	-	2 Skilled worker
		-	X	X	3 Specialist
	343 Public utility services	-	X	-	2 Skilled worker
	514 Service staff in passenger transport	-	X	X	2 Skilled worker
	817 Non-medical therapeutic professionals	-	-	X	3 Specialist
825 Medical engineering, orthopaedics and rehabilitation technology	X	-	-	2 Skilled worker	
Mecklenburg-Western Pomerania	- -	-	-	-	- -
Lower Saxony	242 Metal processing	X	X	-	2 Skilled worker
	244 Metal construction workers and welders	-	X	X	2 Skilled worker
	251 Mechanical engineering and industrial engineering	-	X	-	3 Specialist
	262 Energy technologies	X	X	-	3 Specialist
	263 Electrical engineering	X	X	X	3 Specialist
	272 Technical drawing, construction and model making	X	X	-	3 Specialist
North Rhine-Westphalia	242 Metal processing	X	-	-	2 Skilled worker
	263 Electrical engineering	X	X	X	3 Specialist
	272 Technical drawing, construction, model making	X	X	X	3 Specialist
	343 Public utility services	X	-	-	2 Skilled worker
	434 Software development, programming	-	-	X	2 Skilled worker
Rhineland-Palatinate	413 Chemical industry	-	X	X	2 Skilled worker
Saarland	- -	-	-	-	- -
Saxony	242 Metal processing	X	-	-	3 Specialist
	245 Precision mechanics and tool technology	X	-	X	2 Skilled worker
Saxony-Anhalt	222 Spray painters and varnishers	-	-	X	2 Skilled worker
	244 Metal construction workers and welders	X	X	X	2 Skilled worker
		-	-	X	3 Specialist
263 Electrical engineers	-	-	X	3 Specialist	
Schleswig-Holstein	263 Electrical engineers	-	X	-	3 Specialist
Thuringia	241 Metal production controllers	-	-	X	2 Skilled worker
	242 Metal workers	X	X	-	3 Specialist
	262 Energy technologies	-	-	X	3 Specialist
	263 Electrical engineers	-	-	X	3 Specialist
	272 Technical drawing, construction, model making	-	-	X	3 Specialist
	331 Floor layers and tile setters	-	X	X	2 Skilled worker
	434 Software developers and programmers	-	-	X	3 Specialist

Source: Bundesagentur für Arbeit 2013/2014

6.4 The “positive list” of the Federal Employment Agency

The Federal Employment Agency draws up a so-called positive list in cooperation with the Federal Ministry of Labour and Social Affairs on the basis of the skilled labour shortage analysis, covering occupations in which it is difficult to find domestic skilled workers. It is intended to serve as a source of information for qualified applicants from third countries, making it transparent for them in which occupations and professions they have, in principle, prospects of becoming gainfully employed in Germany. As such, it is limited to professional categories for which no other statutory migration possibilities exist (the EU Blue Card for academics, for instance). If the vocational qualifications of a job applicant in an occupation in which a labour shortage has been identified are established as being equivalent to German vocational qualifications, the Federal Employment Agency can issue approval without carrying out the usual priority examination. The statutory basis for this is set forth in Section 6 subsections 2 and 3 of the Ordinance on the admission of foreigners for the purpose of taking up employment, where it says:

“Foreigners who obtained their vocational qualifications abroad may be permitted to take up employment in a state-approved or comparable training occupation commensurate with their qualifications, if it has been established in accordance with regulations issued by the Federal Government, or the Federal Länder governing the recognition of vocational qualifications assessed that their vocational qualifications are equivalent to the domestic vocational qualifications, and if

1. the persons in question have been placed in a job by the Federal Employment Agency in coordination with the labour authorities of the country of origin, going through the procedure, selection and placement or
2. the Federal Employment Agency has established for the relevant occupation or relevant professional category making a distinction between specific regional features that it is justifiable in terms of labour market and integration policy to fill the job vacancies with foreign applicants.

The Federal Employment Agency can limit the approval to certain countries of origin in the cases mentioned in sentence 1 (2) and define the number of third-country nationals to be admitted on the basis of demand.”

The professional groups sought are, also, encoded and differentiated based on relevant demand in the positive list, in accordance with the above-mentioned professional classification. What may at first glance appear to be a reduction in the number of potential applicants actually creates a certain amount of scope and flexibility regarding professional qualifications in the admission procedure for the labour market. Since the issuing of a residence title is dependent upon the third-country national having a concrete job offer or promise of a job from the employer, a skilled worker from a third country whose qualifications obtained abroad have been recognised in Germany and who can be allocated to the professional category “261 Mechatronics and automation engineering” may be considered for job vacancies that come under the professional classification “251 mechanical engineering and industrial engineering” which are included in the positive list. In this case scenario, although the priority examination would no longer be waived, in principle, in the admission procedure for the labour market, the positive list drawn up by the Federal Employment Agency is not an exclusion list for third-country nationals whose qualifications are not 100 percent equivalent to the occupations defined in the 2010 classification of occupations. If the conditions are fulfilled (in form of a concrete job offer, for example), third-country nationals with comparable qualifications may be granted a residence title for the purposes of gainful employment in Germany, i.e. the positive list is merely a tool that is used to speed up the general admission procedure to the labour market for special groups of skilled workers from third countries. It can also influence whether a qualified third-country national is eligible for an EU Blue Card based on the assumption that they will receive an anticipated minimum salary in the company employing them in the future (cf. Chapter 5.3).

Table 13: Positive list for recognised occupations in which there is a shortage (as at: 16 April 2015)

Professional group (KldB 2010)		Level of qualifications required	
26112	Mechatronics occupations	2	Skilled worker
26113	Mechatronics occupations	3	Specialist
26122	Automation engineering	2	Skilled worker
26123	Automation engineering	3	Specialist
26212	Construction electricians	2	Skilled worker
26222	Electronic engineering technicians	2	Skilled worker
26252	Electrical engineering technicians	2	Skilled worker
26262	Pipe fitters, pipe fitting mechanics	2	Skilled worker
26303	Electronics engineering technicians (without specialisation)	3	Specialist
26393	Electronic engineering supervisors	3	Specialist
34202	Plumbing occupations (without specialisation)	2	Skilled worker
34212	Plumbers, heating engineers and air conditioning mechanics	2	Skilled worker
34213	Plumbers, heating engineers and air conditioning mechanics	3	Specialist
34232	Refrigeration mechanics	2	Skilled worker
34293	Supervisors – plumbers, pipe fitters, heating engineers, air conditioning mechanics	3	Specialist
51113	Occupations involving railway operations	3	Specialist
51222	Railway brake, signal and switch operators and mechanics	2	Skilled worker
51522	Railway brake, signal and switch operators	2	Skilled worker
52202	Locomotive engine drivers	2	Skilled worker
81302	Healthcare and nursing professionals (without specialisation)	2	Skilled worker
81313	Geriatric care professionals (specialisation)	3	Specialist
81332	Surgical/medical-technical professionals	2	Skilled worker
82102 / 82182	Geriatric care professionals	2	Skilled worker
82183	Geriatric care professionals	3	Specialist
82513	Orthopaedic and rehabilitation professionals	3	Specialist
82593	Master craftsmen in orthopaedics, rehabilitation technicians and audiologists (excluding medical technicians, dental technicians and optometrists)	3	Specialist

Source: Bundesagentur für Arbeit 2013/2014

Table 13 is provided as an example of the positive list published by the Federal Employment Agency in April 2015, indicating level 2 and 3 of the qualifications of which there is currently a shortage. It does not include occupational groups 21 (science professionals, mathematicians, engineers), 221 (medical doctors, specialist medical practitioners) and 25 (information and communications technology professionals) mentioned in Section 2 subsection 2 of the Ordinance on the admission of foreigners for the purpose of taking up employment pursuant to the “Commission Recommendation of 29 October 2009 on the use of the International Standard Classification of Occupations”. The figures mentioned here deviate

from the Federal Employment Agency’s classification of occupations, but are reflected in similar form in the 2010 classification of occupations and are taken into account accordingly in the examination procedure. From the perspective of the legislator and the Federal Employment Agency, it is justifiable to fill job vacancies with third-country nationals in the above-mentioned categories if these job vacancies were transparent to the public, i.e. if they had been advertised (over a period of at least 14 days). The positive list is adjusted to the labour market situation whenever two successive skilled labour shortage analyses indicate a new or changed demand for skilled labour.

7 Labour market and labour shortage monitoring

7.1 Data report of the Federal Employment Agency: „Analyse des Arbeitsmarktes für Ausländer (Analysis of the labour market for foreigners)”

The Federal Employment Agency observes the labour market for foreigners and evaluates it using its own data. This data sheds light on market trends at quarterly intervals but also in the individual months under review.¹⁸ The reports document, for instance, changes in the number of persons liable for compulsory social-insurance payments, rates of employment, the share of foreigners in the total number of gainfully employed persons and the main countries of origin of unemployed persons. The report for the month of April 2015, for instance, shows that EU nationals account for 28.5 percent of all registered unemployed foreigners; third-country nationals from the rest of Europe make up the bulk at 45.2 percent, with Turkish nationals accounting for more than every fourth registered unemployed person at 28.7 percent.¹⁹ At the same time, the report records the number of persons participating in training measures, the numbers of various legal groups (Social Code Book II or III), age and wage structure as well as unemployment figures, the number of gainfully-employed persons and their distribution throughout the particular Federal Länder. Data is also published on the individual branches of industry in which the majority of foreigners are employed, the number of registered unemployed foreigners who are taken off the Federal Employment Agency’s register because they have returned to gainful employment or have

left the workforce permanently. However, no distinction is made between EU nationals and third-country nationals at this level of analysis. Furthermore, the Federal Employment Agency does not record any data on the extent to which job vacancies in occupations that have been identified as being subject to labour shortages actually end up being filled by third-country nationals. This means it is not possible to tell whether occupations in groups 21 and 25 (pursuant to Section 2 subsection 2 of the Ordinance on the admission of foreigners for the purpose of taking up employment) are being filled by qualified foreigners. All statistics are based on estimated values and extrapolations.

By contrast, the German Medical Council which is responsible for job category 221 (ISCO-08) keeps its own statistics even though they do not indicate on the basis of which residence title foreign general medical practitioners and specialist medical practitioners are residing in Germany. Notwithstanding this, the trend of recent years in this professional category is absolutely clear, i.e. the share of foreign medical doctors in the total number of all physicians has risen steadily in the past few years (cf. Table 14). However, the statistics only include cumulative values over the course of one year, i.e. they do not shed any light on the number of medical doctors leaving and joining this partial segment of the labour market on this basis.

18 The latest and older archived monthly analyses of the labour market can be accessed under the following link: <https://statistik.arbeitsagentur.de/Navigation/Statistik/Statistische-Analysen/Analytikreports/Zentral/Monatliche-Analytikreports/Analyse-Arbeitsmarkt-Auslaender-nav.html> (8 May 2015).

19 According to a national average of 2013, a total of 513,166 unemployed foreigners were registered with the Federal Employment Agency.

Table 14: Foreign medical doctors and specialist medical practitioners in Germany broken down by main countries/regions of origin (on 31 December of each year)

Country of origin	2010	2011	2012	2013	2014
European Union (EU-27)	13,526	15,674	18,254	20,388	22,080
of whom:					
Bulgaria	770	927	1,111	1,277	1,427
Greece	2,016	2,224	2,556	2,847	3,011
Austria	2,173	2,363	2,491	2,611	2,695
Poland	1,551	1,636	1,759	1,830	1,936
Romania	1,495	2,105	2,910	3,454	3,857
Slovakia	632	759	922	1,029	1,126
Hungary	688	927	1,228	1,423	1,597
Rest of Europe	4,946	5,181	5,616	5,927	6,596
of whom:					
Russian Federation	1,711	1,735	1,814	1,897	1,996
Turkey	903	900	922	924	954
Ukraine	856	872	922	1,002	1,091
Africa	1,164	1,369	1,586	1,823	2,259
of whom:					
Egypt	228	289	429	580	778
Cameroon	132	137	137	143	153
Libya	356	492	542	574	679
America	796	853	934	1,032	1,162
of whom:					
North America	302	314	337	365	389
Central America	109	125	140	173	203
South America	385	414	457	494	570
Asia	4,641	5,043	5,886	6,435	7,292
of whom:					
Iran	1,071	1,081	1,201	1,211	1,245
Jordan	246	336	450	533	599
Syria	867	997	1,165	1,337	1,656
Australia/Oceania	19	23	27	31	33
Others, total	224	212	245	257	239
Total number of foreign doctors	25,316	28,355	32,548	35,893	39,661
Total number of doctors practising medicine in Germany	333,599	342,063	348,695	357,252	365,247

Source: Federal Medical Council 2015

The statistics of the Federal Medical Council show that there has been a steady increase in the number of general practitioners and specialist medical practitioners holding a foreign passport in recent years. The vast majority of general medical practitioners are working as hospital employees. The increase in the number of general medical practitioners who are nationals of Romania, but also third-country nationals from the crisis-ridden countries of Egypt, Libya and Syria, is certainly striking. In the analysis of this sector of the labour market, it is not just the German Medical Council and the subordinate Medical Councils of the Federal

Länder that are relevant. There are also a large number of professional medical associations that gather data and information which ultimately enable conclusions to be drawn on the trend in the individual professions and professional groups.

7.2 Accompanying research of the Institute for Employment Research

The Institute for Employment Research is a research institution that is attached to the Federal Employment Agency which is not just responsible for the carrying

out the above-mentioned skilled labour analysis and for evaluating it. It was responsible for numerous analyses for the BMAS and also publishes individual studies on the current labour market situation at regular intervals, such as in “Topical Reports (Aktuelle Berichte)”, in the “IAB discussion papers” and in the report published in the “IAB Regional”. The IAB calculates, for instance, short-term and regional projection models in the area of employees liable for compulsory social-insurance payments for the following year based on data supplied by the Federal Employment Agency (Schanne et al. 2015) and cooperates with other (private) research institutions in Germany in the area of long-term forecasts. One of the most recent studies under the heading “Zuwanderungsbedarf aus Drittstaaten in Deutschland bis 2050: Szenarien für ein konstantes Erwerbspersonenpotential – unter Berücksichtigung der zukünftigen inländischen Erwerbsbeteiligung und der EU-Binnenmigration (Demand for migrants from third countries in Germany by 2050: Case scenarios for a steady supply of gainfully employed persons, taking into account future domestic labour force participation and migration within the EU)” (Fuchs et al. 2015) were, for instance, drawn up at the request of the Bertelsmann Foundation and explain several long-term forecast models.

Based on the current labour supply potential (comprising gainfully employed persons, unemployed persons and hidden reserves) and assuming that the number of gainfully employed women will continue to rise steadily, it is assumed people will retire at the age of 67 and that net migration will be 200,000 per year on average. This means there will be a labour supply potential of 36.9 million persons by 2050. The analysts counter this with their own case scenario. They take a hypothetical stance and predict a labour supply potential of around 45.1 million persons by 2040 for which they have developed two models: A realistic and worst case scenario.

The realistic case scenario assumes that the number of women in gainful employment will continue to rise and that they will retire at the age of 67, with net migration requiring 533,000 persons per year in order to maintain the current potential labour supply. The worst case scenario is governed by three very unlikely factors:

1. Full alignment in the number of gainfully employed men and women,
2. alignment of the employment rates of German and foreign women and
3. a rise in retirement age to 70.

This results in net migration requirements of 346,000 per year. Based on EUROSTAT data on the demographic trend in the EU-27 (not counting Croatia), the authors also assume that there will be changes in specific countries of origin within the migration flow. Owing to the above-mentioned demographic changes in many EU Member States, migration from these countries will decrease considerably, at least according to their forecasts. Depending on which calculation method is used, the analysts assume the number of migrants will range between 42,000 and 70,000 each year which is significantly below the current figures of around 300,000 per year. In order to maintain the hypothetical labour supply potential of 45.1 million, this means net migration from third countries per year would be between 276,000 and 491,000 persons. However, they only scratch the surface of the issue whether a labour supply potential on the above-mentioned scale is needed in the first place. The ways in which technical advances in production processes may be able to compensate for this are not specified either. However, what is new compared to earlier studies is the assessment of requirements in the individual migration regions.

Despite the many uncertainties that are associated with the forecast models used in this study, it is adopting an approach that is intended to raise awareness of a problem which both industry and politicians will face in the years to come, namely that the current high number of migrants from the Member States of the European Union will not be permanent and that they need to focus more on migration from third countries.

7.3 Political support of labour market processes: Social partners

The Federal Employment Agency and the IAB are important for the permanent and sustainable observation of the labour market as a whole and for identifying skilled labour shortages in Germany. The skilled labour shortage analysis carried out by the Federal

Employment Agency and the job survey carried out by the IAB are updated on a regular basis. They take decisions affecting the labour market into account and identify areas in which political action is needed, at least indirectly, by carrying out analysis of labour demand and the status quo for which the statistics and data provided by the Federal Statistical Office and the Federal Office for Migration and Refugees are important. In addition, there are numerous other institutions and organisations in Germany that observe the labour market, identify the need for migrants, evaluate existing statutory measures and make suggestions for political action.

There is no general or formal procedure for involving employer and employee organisations in determining what occupations should be included in the positive list of the Federal Employment Agency. However this means that the expertise of industrial and trade union representatives has not been taken into account. It is specifically these organisations which are close to the “grassroots” level and which are familiar with the problems of the world of apprenticeship and labour that have provided important contributions to debate and have fuelled discussions over the past few years. This also applies to umbrella organisations such as the Association of German Chambers of Commerce and Industry (Deutscher Industrie- und Handelskammertag, DIHK), the German Trade Union Confederation (Deutscher Gewerkschaftsbund, DGB) and also to regional Chambers of Industry and Commerce and individual occupational trade unions even though major differences in defining goals and political objectives have become apparent.

Whereas the Association of German Chambers of Industry and Commerce recently warned against a tendency in Germany of focussing too much on academic qualifications in view of the decline in apprenticeship contracts at the expense of the dual vocational training system, this allegation was refuted by trade union representatives (Hannack 2015). Instead, trade unions are saying training companies should make a long-term contribution to safeguarding the supply of skilled labour by giving more people with little formal education a chance. All too often, young people leaving lower secondary schools and therefore also many young migrants do not have access to training occupations. Employers argue that many young people

lack the necessary qualifications, for instance, a basic knowledge of mathematics to be able to commence training in the first place.²⁰ The discussion about these and other issues is well underway, is conducted at regular intervals and is aimed at improving educational opportunities in order to be able to leverage resources available in Germany more effectively. The trade unions think this is possible, for instance, by expanding so-called “assisted training”.²¹ Notwithstanding this, there is consensus among employers and trade union that migration, training and skill development can, in principle, be combined with opportunities for the labour market and for ensuring there is a steady supply of skilled labour available in the medium and long term.

A certain alignment of interests can be seen, for instance, in the integration of refugees into the labour market. The trade unions argue that an uncertain residence status creates legal, social and societal obstacles that adversely affect integration (DGB 2015: 22). This opinion is shared by many representatives of industry and the Chambers of Industry and Commerce. In the policy paper recently published by the Association of German Chambers of Industry and Commerce, it says with reference to the residence status of some groups of refugees that

“young foreigners whose deportation has been suspended who have managed to find a training position [...] are able to complete their training. Trainees and companies need legal certainty in terms of their training commitment. Companies also need greater legal and planning certainty in

20 Currently, with the funding program “Integration through Qualification (Förderprogramm IQ)” and the action line “Integration of Asylum Seekers and Refugees (Integration von Asylbewerbern und Flüchtlingen)”, which is part of the ESF Integration Directive, the BMAS provides two major schemes. Both programmes aim to help employers with training activities, for instance in the field of intercultural competences, and offer concrete support for the recruitment skilled workers.

21 “Assisted training” involves a model of cooperative training. With assisted training, a third authority is involved between trainees and the training company who monitors how the young person’s training is progressing and identifies strengths and weaknesses. This makes the training more flexible and customised. It is aimed above at non-skilled Germans (with and without a migration background) and foreigners residing in Germany.

relation to the existing possibilities of subsequent employment. Administrative practises vary greatly at present in this regard. It would be meaningful, for instance, to issue a limited work permit for young persons who have completed vocational training, enabling them to work for their training company for a period of two years, bearing security-related issues in mind (3+2 rule). Educational and training prospects are particularly important for children and young persons who come to Germany without family” (DIHK 2015: 6).²²

With a view to the training market on which it is becoming increasingly difficult for many companies to find suitable candidates to fill training places, reference is also made to the priority examination carried out by the Federal Employment Agency when granting access to the labour market. The sometimes time-consuming procedure makes it difficult and unattractive for companies to recruit apprentices from third countries, or to bring trainees from branches of their companies abroad to Germany for training purposes at least temporarily. The Association of German Chambers of Industry and Commerce is saying that:

“Third-country nationals should at least be able to complete training in occupations in which there is a shortage of trainees without having to undergo a priority examination. The existing positive list of training occupations subject to a labour shortage can serve as a guideline and occupations having difficulty finding suitable candidates to fill training places should be added to this list. However, it would involve much less red tape and be more transparent to not just focus on occupations in which a labour shortage has been identified but, in principle, also to dispense with the priority examination if there is an actual supply of training places available” (DIHK 2015: 3).

The political demand of improving legal certainty for both asylum seekers and people whose deportation has been suspended who are serving an apprenticeship, expressed by DIHK by way of example, has been

taken into account by the redetermination of the right of residence that passed the German Bundestag on 2 July 2015. The act entered into force on 1 August 2015. In general, employer and employee associations are providing important impetus in the debate on skilled labour and are making suggestions on amendments that need to be made in the Immigration Act.

7.4 Private institutions and research facilities

In addition to the above-mentioned employer and employee organisations, to which can be added, for instance, by the Federation of German Industries (Bund der Deutschen Industrie, BDI) and a number of professional associations such as the Association of German Engineers (Verein Deutscher Ingenieure, VDI), there are numerous private organisations that deal with the issues of skilled labour shortages and migration in occupations subject to labour shortages. Without claiming to be exhaustive, a few of these organisations and their most recent publications are mentioned in the following section:

Bertelsmann Foundation

The study mentioned in Chapter 7.2 that was conducted by the IAB and was published by the Bertelsmann Foundation is not the only study commissioned by the organisation in the past few years. Rather, the Bertelsmann Foundation carries out and edits studies itself at regular intervals and also gathers data on developments on the German labour market and on potential skilled labour shortages. The study “Arbeitsmarkt 2013 (Labour Market 2030)”, for instance, was commissioned by the Federal Ministry of Labour and Social Affairs, identifying the labour supply needs for the years to come based on its own calculations and its own population projections. The basic assumptions in this study are similar to those outlined in the progress report published by the Federal Government (activation, domestic labour potential, increase in gainful employment among women, immigration etc.) and were ultimately identified as the main areas in which political action is needed. The calculations made by the author in this study deviate from the 12th Coordinated Population Forecast published by the Federal Statistical Office and takes the most recent migration figures to Germany into account (Vogler-Ludwig et al. 2015: 2). This study also includes several population

22 In case of starting an apprenticeship the residential security is guaranteed through effective State decrees in some Federal Länder. For qualified people whose deportation has been suspended, the provisions of Section 18a of the Residence Act could apply.

models involving different migration figures that are based on the trends observed in recent years. The calculation variant “High migration”, for instance, is based on a presumed net migration of 300,000 per year from 2020, with this level being sustained until 2030 in the model. “On an annual average from 2014 to 2030, net migration is in the region of 330,000, and 5.6 million for the entire period” (Vogler-Ludwig et al. 2015: 2). Contrary to the labour shortage analysis carried out by the Federal Employment Agency and the job survey carried out by the Institute for Employment Research, the authors of this study are operating more with actual trend and demand statistics. It is anticipated, for instance for the “High migration” model, that over time there will be some serious shifts in the supply of labour in selected professional groups:

Inspectors, mail dispatchers	+81,000	+14 %
Artists, journalists	+90,000	+11 %
Engineers and scientists	+135,000	+11 %
Professions in the humanities and natural sciences	+45,000	+10 %
Financial experts	+63,000	+7 %
Managers and senior civil servants	+136,000	+5 %
Ceramicists, glass makers	-11,000	-32 %
Textile, clothing and leather occupation	-44,000	-27 %
Unskilled workers	-221,000	-24 %
Other workers	-177,000	-24 %
Paper and printing occupations	-32,000	-21 %

The authors of this study are aware that the above-mentioned statistics involve a large number of projection uncertainties and also depend on the textbook model assumptions. This is why the case scenarios outlined are hypothetical case scenarios but by no means certain case scenarios. The study also enables the conclusion to be drawn that no matter how high migration from third countries may be, temporary skilled labour shortages are likely to occur repeatedly, owing to the dynamic market trend and changes taking place in economic and occupational structures.

Institute for the Study of Labour

The Institute for the Study of Labour (Forschungsinstitut zur Zukunft der Arbeit, IZA) is a private research institution, which has its registered office in Bonn. It publishes articles on the subject at regular intervals. Whereas the Bertelsmann study focuses on

demographics and trends in migration figures, the above-mentioned calculation basis in the latest study carried out by the Institute for the Study of Labour “Zukünftige Fachkräftengpässe in Deutschland? (Will Germany face skilled labour shortages in the future?” (Dräger 2014), for instance, includes the parameters GDP and capital stock development as well as the volume of labour. As in the above-mentioned Bertelsmann study, the author assumes that there will be changes to the employee and qualification structure of national and migrant skilled workers. Via the four “levers” gainful employment rate, acquisition of qualifications, migration and working hours that have a crucial impact on GDP growth and in safeguarding prosperity, the author develops three case scenarios for developments up to 2030. The conclusion she comes to is that if GDP grows moderately by 1.1 percent per year and if technical advancement manages to compensate for a decline in the number of gainfully employed persons, there will be no reason to expect nationwide skilled labour shortages provided the labour supply potential increases. This would mean encouraging older persons and women to join the workforce, more and more gainfully employed people obtaining an academic degree, the average working hours remaining stable and net migration remaining high (200,000 per year). If it is assumed, on the contrary, that GDP was to grow by 1.4 percent per year on average, this would lead to tangible labour shortages, not just in academic professions but also in technical occupations and skilled occupations. The study is based on the statistics outlined in the 12th Coordinated Population Forecast and fits into the series of trend extrapolations. However, it does not make any statements about regional differences.

Cologne Institute for Economic Research

Cologne Institute for Economic Research (Institut der deutschen Wirtschaft Köln, IW Köln) publishes studies on the subject of skilled labour, demographic trends and safeguarding the supply of skilled labour at regular intervals, focusing, for instance, on the level of education of skilled workers as jobs vacancies to be filled by academics are frequently not registered with the Federal Employment Agency but are filled through other channels. This applies, for instance, to jobs in MINT professions. The annual MINT reports that regularly appear in spring and autumn evaluate the migration of skilled workers, trends in the number of students of recent years and basic education potential

in this sector (Anger et al. 2015). The study focuses on the additional demand for engineers and natural science professionals until 2029, fuelled by demographic trends and national demand. Moreover, the analysis of wage developments in MINT professions shows that wages in both academic and training professions were rising over the last years. In addition to that, a rather subject-specific study of Koppel (2015) focuses on the expected bottlenecks in the group of engineers up to 2029.

In this context, another study of the Cologne Institute shows that in the period from 2003 to 2012 around 44 percent of foreign students who enrolled at German universities and colleges in MINT subjects take up employment in Germany after passing their exams. It also identified students enrolled at German universities and colleges as an important target group for ensuring there is a steady supply of skilled labour in the future (Alichniewicz/Geis 2013). Therefore, the study focuses heavily on student numbers and demographic trends, but does not analyse salary trends in MINT professions which could have shed light on whether a dynamic trend exists for attracting staff via the pressure on wages and salaries and for companies retaining them.

Based on the statistics of the Federal Employment Agency, Cologne Institute for Economic Research conducts own shortage analyses and has recently published a study that deals with expected skilled labour shortages, although the authors focus mainly on the age structure of employees for selected professional groups subject to labour shortages and derive companies' future demand for staff from them. Whereas the analysis "Fachkräfteengpässe in Unternehmen (Skilled labour shortages in companies)" (Bußmann/Seyda 2014) funded by the Federal Ministry for Economic Affairs and Energy (BMWi), and conducted within the project "Fachkräftesicherung für kleine und mittlere Unternehmen (KOFA)" (Safeguarding of skilled labour for SME), is not limited to the issue of migration, it highlights a problem that German industry could potentially face increasingly in the years to come. Whereas many large companies are attractive to skilled workers from third countries, even today as they have many ways of enhancing their image, this does not apply to the same extent to many smaller and medium sized companies (SMEs). However, as German industry is strongly influenced by small and medium-sized companies and many of them complain that they are

having growing difficulty filling job vacancies, owing to the positive economic and cyclical climate, new staffing strategies will need to be developed in order to counteract labour shortages. As part of the KOFA study the recommendations for action are therefore directed at company managers, members of human resources staffs and employees in charge of personnel although they remain rather general and follow the pathways for ensuring a steady supply of labour outlined in the progress report on the skilled labour concept drawn up by the Federal Government. Their intention is to raise awareness by sensitising responsible persons in SMEs for the skilled labour subject. However, one weak point of the study consists of the fact that – and the authors basically admitted this themselves (Bußmann/Seyda 2014: 5) – skilled labour shortages can only be proven if the market is observed over extended periods and at regular intervals. As no such statistics are available at present, any statements made about the skilled labour situation based on the labour shortage analysis of the Cologne Institute are snapshots that combine complex analyses with educational elements.

German Institute for Employment Research

The German Institute for Employment Research (Deutsches Institut für Wirtschaftsforschung, DIW) which has its registered office in Berlin is one of the leading economic research institutions in Germany. It deals with the entire bandwidth of micro- and macro-economic issues and is affiliated with the Research Infrastructure SOEP (German Socio-Economic Panel Study), a long-term representative study that has been conducted each year since 1984 and focuses, inter alia, on the topics of employment and gainful employment. DIW publishes weekly studies, quarterly reports and individual reports on the subject of skilled labour at regular intervals. One of the Institute's publications from 2014 summarises topical debate contributions on the subject of skilled labour shortages. In her article "Die Debatte über den Fachkräftemangel (The debate on skilled labour shortages)", Nina Neubecker pointed out the general problem associated with the fact that different results are achieved depending on what parameters are used for analyses, they can ultimately be interpreted for political purposes. There was also a lack of consensus in selecting labour shortage indicators and meaningful model assumptions for long-term projections, Neubecker said. In her paper, she says that although there is consensus in the scientific community that there can be no mention of a general shortage

of skilled labour in Germany, this consensus quickly disintegrates when it is a matter of identifying individual occupations or professional groups, with the exception of the medical profession. It is equally difficult to identify general and not just frictional skilled labour shortages – and that is the unspoken implication of the paper – to pass relevant recommendations for action on to politicians and to name specific numbers of skilled migrants needed which does not do justice to the dynamic nature of the market and the changes in cyclical components.

Brief summary

In addition to the above-mentioned institutions and research facilities, there are a number of other organisations in Germany that deal with the topic of the labour market and skilled labour shortages. They include Reconstruction Loan Corporation (Kreditanstalt für Wiederaufbau, KfW), the Federal Institute for Vocational Training (Bundesinstitut für Berufsbildung, BIBB), which conducts other studies in cooperation with the Institute for Employment Research, the Hamburg World Economy Institute (Hamburgische Weltwirtschaftsinstitut, HWWI) and individual professorships at German universities and universities of applied sciences. The above-mentioned studies all have strengths and weaknesses and focus on one or several parameters (age structure, level of prosperity, quantity versus quality of migration etc.), depending on the research focus of the organisation funding them, even though the different results frequently complement each other, back up the global trend of a shrinking labour supply potential and the long-term demographic change, confirming the need for action. However, they do so using very different interpretations since there is no “King’s variable” for identifying skilled labour shortages. This explains why there is so much scope for interpretation. The above-mentioned parameters are all reflected in the current political debate on how to secure the supply of skilled labour in the medium to long term (cf. Chapter 4), with the result that migration (from third countries) has become a more or less weighted but almost unquestionable component in the overall strategy.

8 Challenges and obstacles

The problems associated with identifying skilled labour shortages are above all of methodical nature. This becomes clear when, for example, the length of time it takes to fill a job vacancy is used as an indicator. If the length of time it takes to fill a job vacancy measures the period between the date by which the company would like to fill the job vacancy and the date on which the job is removed from the Federal Employment Agency's books, it is not possible to assess in each case whether the job vacancy has meanwhile been filled or whether the company no longer wishes to fill the position. Companies no longer wishing to fill the job vacancy can, for instance, be the result of a mismatch between the job profile and the applicant profile. Yet it can also be associated with a change in the company's financial situation meaning it can no longer afford to hire a new member of staff and/or no longer has enough contracts to employ them. The reasons for this can be manifold. As difficult as it appears to be to identify actual skilled labour shortages, it is equally difficult to measure the effects policy measures set forth in the Residence Act are having on the general labour market trends.

The dynamic nature of the economy also renders statistical coverage difficult, for instance, in relation to the EU Blue Card. It is true that it is possible to record the number of persons who are working in occupations and have been recognised as having labour shortages pursuant to Section 19a of the Residence Act. However, the vast majority of gainfully employed third-country nationals continue to reside in Germany on the basis of Section 18 subsection 4 of the Residence Act and are probably working in similar or equivalent jobs offering similar or equal earning potential. The Central Register of Foreign nationals that is kept by Federal Office for Migration and Refugees (BAMF) captures statistics on the holders of the EU Blue Card in recognised occupations subject to labour shortages through the number of residence titles issued. But it does not keep statistics on the number of the gainfully employed persons employed in occupations in which labour shortages have been identified,

since this is no storage fact in the mentioned Central Register.

Another statistical problem has emerged in relation to the recording of all third-country nationals residing in German pursuant to Section 19a of the Residence Act. Although the statistics show standard occupations and occupations subject to labour shortages, many of the third-country nationals captured in the category of "standard occupations" are actually employed in occupations subject to labour shortages. This problem has emerged because the Federal Employment Agency and the foreigner authorities do not check whether the payment of minimum wages required by law involves employment in occupations subject to labour shortages (for which in the final analysis lower threshold values would be sufficient).

The dynamic processes within commercial enterprises which allow for a certain permeability in job profiles and professional categories can also be problematic for statistical returns. One example: A third-country national residing in Germany who is employed as a skilled worker in a metal processing occupation (in which there is no shortage of labour) is participating in an advanced training measure or is undergoing full retraining as a mechatronics technician (an occupation that is subject to labour shortages) within the operating procedures of his current employer whom he will continue to work for once he has passed his final exam. By successfully completing the skills upgrading measure, the third-country national can carry out a wider range of tasks in the company and might suddenly find himself actually being a skilled worker in an occupation in which a labour shortage has been identified. This may not necessarily have any implications for his residence status since in this example he has not changed employer and therefore does not face a disclosure requirement. Since the job vacancy in the occupation subject to labour shortage in this case was not advertised and the Federal Employment Agency was not notified of the job vacancy, the Federal Employment Agency itself does not receive any informa-

tion about any such in-house measures even though this particular company may have had a long-standing vacancy or labour shortage in the area of mechatronics for a very long time. Thus, calculations of the Federal Employment Agency are only approximated values, because the scope and extend of this intrinsic need for adjustment is not fully recognised respectively recorded with a slight delay. However, the Agency incorporates these types of considerations into its labour shortage analysis.

A general methodical problem associated with identifying skilled labour shortages and ultimately also with observing and evaluating political counter-measures is that companies are not obliged to notify the labour authorities, if they need skilled workers with the result that only every second job vacancy is registered with the Federal Employment Agency. Indeed, the frequency with which the Federal Employment Agency is notified of job vacancies also varies from occupation to occupation. To what extent companies are filling non-advertised job vacancies in occupations subject to labour shortages with third-country nationals already residing in Germany who hold a valid residence permit, for instance, cannot be fully recorded as there are meanwhile a large number of occupations and professional groups that no longer require the approval of the Federal Employment Agency. Although foreigners authorities generally need to be notified when a foreigner changes employer – depending on what residence title they hold – this information does not represent occupational statistics within the meaning of statistics on job classifications.

A further problem in quantifying skilled labour shortages can be attributed to the fact that labour shortages identified at regional or national level only occur temporarily in some occupations and professional groups. This means that a third-country national who was granted a residence permit in 2015 to work in an occupation that is subject to a labour shortage (with the approval of the Federal Employment Agency) may no longer be working in an occupation that is subject to a labour shortage in 2016 if the situation on the labour has eased in the meantime – for whatever reason. Whether this easing can be attributed to political measures previously implemented can frequently only be evaluated after a certain amount of time has elapsed, if at all, as some reforms may have been made

years before and it may take several years for them to take effect. It is difficult in methodical terms to attribute the success unequivocally to individual measures. It must also be borne in mind that some amendments and their scope for action may take time to reach the public domain and to garner the relevant acceptance. This actually applies to Section 32 of the Ordinance on the admission of foreigners for the purpose of taking up employment (highly qualified foreigners whose deportation has been suspended) and not least to Section 18c of the Residence Act.

It is also uncertain what role advancements in technology in compensating for a lack of skilled workers play and to what extent they can maintain the level of prosperity and the “restructuring” of the economy resulting from natural processes involving market adjustments. Current sample calculations for the future demand for skilled labour are frequently based on the economical use of statistics in which the actual skilled labour available is used simultaneously as an actual substitute. In actual fact, it is only possible to predict the demand for skilled labour in the individual branches of business and industry to a limited extent as there is reason to assume that many industries will undergo gradual changes over the years to come and will face many adjustments. The assumptions on which the projections are based say rather little about future trends in gainful employment and on the propensity of people to engage in gainful employment. Nearly all of the above-mentioned forecast models assume, for instance, that gainfully employed persons will leave the workforce once they reach retirement age of 65 or 67. It is difficult, if not impossible, to predict the extent to which flexible working hour models will encourage older persons who have passed retirement age to carry on working than it has previously been the case and involves the same level of uncertainty. The models used also say little about how many of the third-country nationals who came to Germany will actually be permanently available to the labour market. Whether short-term but perhaps more frequent work stays in Germany will play a more important role in Germany in years to come than they do today is not certain. This applies to the average duration of stay in a larger context.

9 Conclusion

Discussions about skilled labour shortages have been rife and controversial in recent years against the backdrop of demographic change and they are by no means over. The results cannot be considered to be definitive. Studies, working and discussion papers on skilled labour shortages that highlight the focal points of observations are published at regular intervals, focusing on different observations. It is possible to derive a number of recommendations for action and they too can be summed up in a package of measures as follows: in addition to upskilling the unemployed, improving educational opportunities in all age groups and strengthening the concept of lifelong learning (from school to university and apprenticeship right up to advanced training within companies), enhancing gainful employment of women and the integration of older persons into the labour market, migration has become an integral part of relevant strategies aimed at ensuring there is a steady supply of labour in the medium and long term.

Several potential groups have been identified in the field of migration which should have been taken more into account to ensure there is a steady supply of labour in general and filling job vacancies in occupations subject to labour shortages in particular. They include both foreign students and apprentices who need to be integrated more effectively into professional life in Germany once they have completed their education as well as skilled workers from other third countries, although demand and future labour shortage trends will give advice on where the Immigration Act needs to be amended in order to facilitate the admission of third-country nationals. Some regulations have been eased significantly in the past, for instance, in relation to the obligation to obtain the approval of the Federal Employment Agency, a requirement that has been waived for a large number of occupations and professional groups. Generally speaking, the Federal Government and most research institutions base their future expectations on visible changes in migration flows. We

will witness a decline in migration from EU Member States where the majority of labour migrants come from today owing to comparable demographic situations in the countries of origin, particularly in Eastern Central Europe and South-East Europe. Migrants from third-countries will have to compensate for this, if the demand for them remains as high as it is today.

It is difficult to predict how individual branches of industry will develop and in what areas skilled labour shortages will emerge in the future. The fact that the labour market is being monitored by the Federal Employment Agency, the Institute for Employment Research and by numerous private research institutes is providing information that will enable (potential) skilled labour shortages to be identified against the backdrop of demographic change and will make suggestions for action as to how migration can be managed. This is certainly presenting politicians with more than a few challenges. Given that the trends are foreseeable on the basis of the current calculations and projections, politicians have basically no choice but to take immediate action on the one hand, without making a detailed impact assessment that could only be guaranteed retrospectively on the other.

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Annex

A1: Workers employed by specific occupations as at 30 June 2014

	Employees (subject to social insurance contributions)												
	of which												
	Total			Foreign nationals			EU citizens			Third-country nationals			
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	
ISCO-08	30,174,505	16,240,821	13,933,684	2,563,286	1,585,000	978,286	1,362,693	822,789	539,904	1,200,593	762,211	438,382	
214 Engineering professionals (excluding electrotechnology)	515,308	438,358	76,950	35,346	28,402	6,944	20,306	16,464	3,842	15,040	11,938	3,102	
216 Architects, planners, surveyors and designers	138,131	74,326	63,805	9,708	5,469	4,239	6,174	3,407	2,767	3,534	2,062	1,472	
222 Nursing and midwifery professionals	26,505	3,483	23,022	761	75	686	499	35	464	262	40	222	
23 Teaching professionals	566,623	236,999	329,624	43,338	20,970	22,368	21,079	9,108	11,971	22,259	11,862	10,397	
2411 Accountants	116,964	65,494	51,470	5,510	2,510	3,000	3,230	1,598	1,632	2,280	912	1,368	
25 Information and communications technology professionals	433,736	366,670	67,066	32,084	25,480	6,604	15,759	12,681	3,078	16,325	12,799	3,526	
251 Software and applications developers and analysts	353,094	295,659	57,435	28,483	22,507	5,976	13,643	10,895	2,748	14,840	11,612	3,228	
252 Database and network professionals	80,642	71,011	9,631	3,601	2,973	628	2,116	1,786	330	1,485	1,187	298	
51 Personal services workers	1,151,956	549,031	602,925	168,958	95,845	73,113	97,008	53,604	43,404	71,950	42,241	29,709	
5120 Cooks	221,542	140,121	81,421	42,681	32,805	9,876	21,636	16,194	5,442	21,045	16,611	4,434	
5131 Waiters	288,427	96,478	191,949	71,044	36,128	34,916	44,097	21,480	22,617	26,947	14,648	12,299	
5151 Cleaning and housekeep services in offices, hotels and other establishments	96,185	7,112	89,073	7,897	1,011	6,886	4,959	571	4,388	2,938	440	2,498	
5152 Domestic housekeepers	7,597	891	6,706	666	122	544	388	47	341	278	75	203	

Source: Bundesagentur für Arbeit 2015

A1: Workers employed by specific occupations as at 30 June 2014 (continued)

ISCO-08	Employees (subject to social insurance contributions)											
	of which											
	Total			Foreign nationals			EU citizens			Third-country nationals		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
53	519,627	92,522	427,105	47,845	7,718	40,127	25,525	3,361	22,164	22,320	4,357	17,963
5311	70,294	12,833	57,461	4,830	617	4,213	2,580	255	2,325	2,250	362	1,888
5321	402,412	67,281	335,131	40,770	6,644	34,126	21,803	2,924	18,879	18,967	3,720	15,247
5322	34,781	7,876	26,905	1,833	336	1,497	907	127	780	926	209	717
6	209,123	168,637	40,486	12,675	11,236	1,439	8,247	7,188	1,059	4,428	4,048	380
6111	3,245	2,117	1,128	546	404	142	457	338	119	89	66	23
6113	129,780	104,800	24,980	9,461	8,592	869	5,572	4,958	614	3,889	3,634	255
6121	17,404	9,529	7,875	614	468	146	531	419	112	83	49	34

Source: Bundesagentur für Arbeit 2015

A2: Exclusively marginally employed workers by selected occupations as at 30 June 2014

	ISCO-08	Exclusively marginally employed											
		Total						of which					
		Total	Male	Female	Total	Male	Female	Foreign nationals	EU citizens	Third-country nationals	Total	Male	Female
214	Engineering professionals (excluding electrotechnology)	7,588	5,911	1,677	343	230	113	162	114	48	181	116	65
216	Architects, planners, surveyors and designers	7,527	3,425	4,102	634	258	376	285	118	167	349	140	209
222	Nursing and midwifery professionals	247	*	*	8	-	8	3	-	3	5	-	5
23	Teaching professionals	104,311	50,967	53,344	7,201	3,373	3,828	2,438	962	1,476	4,763	2,411	2,352
2411	Accountants	2,450	1,497	953	50	31	19	21	13	8	29	18	11
25	Information and communications technology professionals	8,689	7,250	1,439	530	349	181	224	155	69	306	194	112
251	Software and applications developers and analysts	6,619	5,370	1,249	457	294	163	185	124	61	272	170	102
252	Database and network professionals	2,070	1,880	190	73	55	18	39	31	8	34	24	10
51	Personal services workers	553,208	238,840	314,368	60,233	27,032	33,201	26,977	12,007	14,970	33,256	15,025	18,231
5120	Cooks	26,348	11,080	15,268	5,363	3,113	2,250	2,074	1,222	852	3,289	1,891	1,398
5131	Waiters	274,405	74,742	199,663	36,897	14,673	22,224	16,305	5,797	10,508	20,592	8,876	11,716
5151	Cleaning and housekeep services in offices, hotels and other establishments	14,710	1,133	13,577	1,252	112	1,140	562	53	509	690	59	631
5152	Domestic housekeepers	2,055	401	1,654	135	33	102	59	14	45	76	19	57

Source: Bundesagentur für Arbeit 2015

A2: Exclusively marginally employed workers by selected occupations as at 30 June 2014 (continued)

ISCO-08	Exclusively marginally employed														
	Total						Foreign nationals			EU citizens			Third-country nationals		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female			
53	93,665	16,553	77,112	6,649	1,151	5,498	2,620	352	2,268	4,029	799	3,230			
5311	32,151	4,319	27,832	1,742	192	1,550	793	82	711	949	110	839			
5321	51,977	10,147	41,830	4,462	882	3,580	1,604	236	1,368	2,858	646	2,212			
5322	4,847	860	3,987	233	42	191	116	20	96	117	22	95			
6	27,217	18,891	8,326	2,086	1,276	810	1,427	789	638	659	487	172			
6111	522	233	289	102	43	59	85	38	47	17	5	12			
6113	19,046	13,736	5,310	1,355	946	409	845	537	308	510	409	101			
6121	1,143	484	659	68	34	34	45	22	23	23	12	11			

Source: Bundesagentur für Arbeit 2015

A3: Vacancies registered with the BA by selected occupations (on average for the year 2014)

ISCO-08		Vacancies registered with the BA
214	Engineering professionals (excluding electrotechnology)	7,257
216	Architects, planners, surveyors and designers	1,740
222	Nursing and midwifery professionals	342
23	Teaching professionals	2,648
2411	Accountants	884
25	Information and communications technology professionals	7,905
251	Software and applications developers and analysts	6,790
252	Database and network professionals	1,115
51	Personal services workers	33,520
5120	Cooks	8,507
5131	Waiters	12,543
5151	Cleaning and housekeep services in offices, hotels and other establishments	1,296
5152	Domestic housekeepers	42
53	Personal care workers	7,603
5311	Child care workers	287
5321	Health care assistants	5,521
5322	Home-based personal care workers	1,689
6	Skilled agriculture, forestry and fishery workers	3,725
6111	Field crop and vegetable growers	32
6113	Gardeners, horticultural and nursery growers	2,548
6121	Livestock and dairy producers	311

Source: Bundesagentur für Arbeit 2015

A4: Conversion key: ISCO-08 / KldB 2010

International Standard Classification of Occupations (ISCO-08)	ISCO-08	KldB 2010	German Classification of Occupations (KldB 2010)	
Engineering professionals (excluding electrotechnology and telecommunications)	214	2141	25194	Managers in machine-building and -operating
			25294	Managers in the automotive, aeronautic, aerospace and ship building industries
			27304	Technical occupations in production planning and scheduling – highly complex tasks
	2142	24414	Occupations in metal constructing – highly complex tasks	
		31144	Occupations in water resource management – highly complex tasks	
		31164	Construction surveyors and inspectors – highly complex tasks	
		32104	Occupations in building construction (without specialisation) – highly complex tasks	
		32204	Occupations in civil engineering (without specialisation) – highly complex tasks	
		32224	Occupations in road and asphalt construction – highly complex tasks	
		32264	Occupations in land improvement and hydraulic construction – highly complex tasks	
		34104	Occupations in building services engineering (without specialisation) – highly complex tasks	
		34214	Occupations in sanitation, heating, ventilating, and air conditioning – highly complex tasks	
		34324	Occupations in pipeline construction	
		41434	Occupations in construction materials testing – highly complex tasks	
		42114	Occupations in geotechnical engineering – highly complex tasks	
		2142/2164	51224	Occupations in the inspection and maintenance of railway infrastructure – highly complex tasks
		2143	11724	Occupations in landscape preservation – highly complex tasks
			34314	Technical occupations in water supply and wastewater disposal – highly complex tasks
			34334	Occupations in waste management – highly complex tasks
			42204	Occupations in environmental protection engineering (without specialisation) – highly complex tasks
	2144	23124	Occupations in paper-processing and packaging – highly complex tasks	
		24424	Occupations in welding and joining – highly complex tasks	
		24514	Occupations in precision mechanics – highly complex tasks	
		24524	Occupations in tool making – highly complex tasks	
		25104	Occupations in machine-building and -operating (without specialisation) – highly complex tasks	
		25134	Technical service staff in maintenance and repair – highly complex tasks	
		25184	Occupations in machine-building and -operating (with specialisation, not elsewhere classified) – highly complex tasks	
	25214	Technical occupations in the automotive industries – highly complex tasks		

International Standard Classification of Occupations (ISCO-08)	ISCO-08	KldB 2010	German Classification of Occupations (KldB 2010)	
Engineering professionals (excluding electrotechnology and telecommunications) – continued		25224	Technical occupations, agricultural and construction machinery – highly complex tasks	
		25234	Technical occupations in the aeronautic and aerospace industries – highly complex tasks	
		25244	Technical occupations in ship building – highly complex tasks	
		25254	Technical occupations in the maintenance and construction of bicycles and motorbikes – highly complex tasks	
		34234	Occupations in ventilating, and air conditioning – highly complex tasks	
		34304	Occupations in building services and waste disposal (without specialisation) – highly complex tasks	
		34344	Occupations in plant, vessels, tank and apparatus construction – highly complex tasks	
	2145	22104	Occupations in plastic- and rubber-making (without specialisation) – highly complex tasks	
		22184	Occupations in plastic- and rubber-making and -processing (with specialisation, not elsewhere classified) – highly complex tasks	
		22204	Occupations in colour coating and varnishing (without specialisation) – highly complex tasks	
		23114	Occupations in paper-making (without specialisation) – highly complex tasks	
		29104	Occupations in beverage production (without specialisation) – highly complex tasks	
		29114	Brewers and maltsters – highly complex tasks	
		29134	Distillers – highly complex tasks	
		29204	Occupations in the production of foodstuffs (without specialisation) – highly complex tasks	
		29284	Occupations in the production of foodstuffs (with specialisation, not elsewhere classified) – highly complex tasks	
		41314	Occupations in chemical and pharmaceutical engineering – highly complex tasks	
		2146	21114	Occupations in underground and surface mining – highly complex tasks
			24124	Occupations in metal moulding – highly complex tasks
			24134	Occupations in industrial metal casting – highly complex tasks
	24304		Occupations in treatment of metal surfaces (without specialisation) – highly complex tasks	
	41424		Occupations in material engineering – highly complex tasks	
	2149	21124	Occupations in blasting engineering – highly complex tasks	
		22304	Occupations in wood-working and -processing (without specialisation) – highly complex tasks	
		22394	Managers in wood-working and -processing	
		23314	Occupations in photographic technology – highly complex tasks	
		23414	Occupations in printing technology – highly complex tasks	
		24244	Occupations in laser-assisted metalworking – highly complex tasks	

International Standard Classification of Occupations (ISCO-08)	ISCO-08	KldB 2010	German Classification of Occupations (KldB 2010)			
Engineering professionals (excluding electrotechnology and telecommunications) – continued	2149	26384	Occupations in electrical engineering (with specialisation, not elsewhere classified) – highly complex tasks			
		27104	Occupations in technical research and development (without specialisation) – highly complex tasks			
		27184	Occupations in technical research and development (with specialisation, not elsewhere classified) – highly complex tasks			
		27224	Occupations in technical design and apparatus building – highly complex tasks			
		27284	Technical draftspersons, engineering designers and model makers (with specialisation, not elsewhere classified) – highly complex tasks			
		28104	Occupations in textile making (without specialisation) – highly complex tasks			
		28194	Managers in textile making			
		28224	Occupations in the production of clothing, hat and cap making – highly complex tasks			
		28294	Managers in the production of clothing and other textile products			
		28314	Occupations in leather making – highly complex tasks			
		28394	Managers in leather- and fur-making and -processing			
		41414	Physical technical laboratory occupations – highly complex tasks			
		51534	Occupations in the surveillance and control of air traffic – highly complex tasks			
		53124	Occupations focusing on workplace safety and safety technology – highly complex tasks			
		53134	Occupations in fire protection – highly complex tasks			
		81224	Technical occupations in medical laboratories for functional diagnostics – highly complex tasks			
		82504	Technical occupations in medicine (without specialisation) – highly complex tasks			
		82514	Technical occupations in orthopaedic and rehabilitation – highly complex tasks			
		82534	Occupations in hearing-aid acoustics – highly complex tasks			
		93604	Occupations in musical instrument making (without specialisation) – highly complex tasks			
		94514	Technical occupations in event technology and stagecraft – highly complex tasks			
		Architects, planners, surveyors and designers	216	2161	31114	Occupations in architecture – highly complex tasks
					31154	Occupations in the maintenance and renovation of buildings – highly complex tasks
93214	Occupations in interior design – highly complex tasks					
2162	12144			Occupations in horticulture, landscape gardening, and sports field maintenance – highly complex tasks		
2163	28113			Occupations in textile design – complex tasks		
	28114			Occupations in textile design – highly complex tasks		

International Standard Classification of Occupations (ISCO-08)	ISCO-08	KldB 2010	German Classification of Occupations (KldB 2010)	
Architects, planners, surveyors and designers – continued		28214	Occupations in fashion design – highly complex tasks	
		28333	Occupations in shoemaking – complex tasks	
		28343	Occupations in fur treatment and processing – complex tasks	
		93102	Occupations in product and industrial design – skilled tasks	
		93103	Occupations in product and industrial design – complex tasks	
		93104	Occupations in product and industrial design – highly complex tasks	
		93333	Occupations in turnery and toy manufacture – complex tasks	
		93413	Artisans designing ceramics – complex tasks	
		93433	Artisans working in glass blowing – complex tasks	
		93513	Artisans working with metal – complex tasks	
		93523	Artisans producing jewellery or working with precious stones and metals – complex tasks	
		93524	Artisans producing jewellery or working with precious stones and metals – highly complex tasks	
		94614	Stage and costume designers – highly complex tasks	
		2164	31124	Occupations in urban and spatial planning – highly complex tasks
			31134	Occupations in the planning of traffic routes and other infrastructure – highly complex tasks
			51224	Occupations in the inspection and maintenance of railway infrastructure – highly complex tasks
			51504	Occupations in traffic surveillance and control (without specialisation) – highly complex tasks
		2165	31214	Occupations in surveying – highly complex tasks
			31224	Occupations in cartography – highly complex tasks
		2166	23222	Occupations in graphic, communication, and photo design – skilled tasks
			23223	Occupations in graphic, communication, and photo design – complex tasks
			23224	Occupations in graphic, communication, and photo design – highly complex tasks
		Nursing and midwifery professionals	222	2221
2222	81353 Occupations in obstetrics and maternity care – complex tasks			
Teaching professionals	23	2310	84304 Teachers and researcher at universities and colleges – highly complex tasks	
			2320	84213 Teachers for occupation-specific subjects at vocational schools – complex tasks
		84214 Teachers for occupation-specific subjects at vocational schools – highly complex tasks		
		84223 In-company instructors in vocational training – complex tasks		
		84224 In-company instructors in vocational training – highly complex tasks		
		84404 Teachers in adult education (without specialisation) – highly complex tasks		

International Standard Classification of Occupations (ISCO-08)	ISCO-08	KldB 2010	German Classification of Occupations (KldB 2010)			
Teaching professionals – continued		2330	84124	Teachers in secondary education – highly complex tasks		
		2341	84114	Teachers in primary education – highly complex tasks		
		2342	83112	Occupations in child care and child-rearing – skilled tasks		
		2351	84144	Occupations in teacher training – highly complex tasks		
			91334	Occupations in pedagogy – highly complex tasks		
		2352	83134	Pedagogic specialists in social care work and special needs education – highly complex tasks		
			84134	Teachers in schools for special needs education – highly complex tasks		
		2353	84454	(Foreign) Language teachers – highly complex tasks		
		2354	84412	Occupations in music education – skilled tasks		
			84413	Occupations in music education – complex tasks		
			84414	Occupations in music education – highly complex tasks		
		2355	84434	Occupations in art and theatre education – highly complex tasks		
			84533	Dance instructors – complex tasks		
		2356	84444	Occupations in IT-application training – highly complex tasks		
		2359	84184	Teachers in schools of general education (with specialisation, not elsewhere classified) – highly complex tasks		
			84483	Teachers at educational institutions other than schools (with specialisation, not elsewhere classified except driving, flying and sports instructors) – complex tasks		
			84484	Teachers at educational institutions other than schools (with specialisation, not elsewhere classified except driving, flying and sports instructors) – highly complex tasks		
		Accountants	2411		31174	Occupations in construction accounting and cost calculation for buildings – highly complex tasks
					72214	Occupations in accounting – highly complex tasks
	72224			Occupations in cost accounting and calculation – highly complex tasks		
	72234			Occupations in controlling – highly complex tasks		
	72243			Occupations in auditing – complex tasks		
	72244			Occupations in auditing – highly complex tasks		
	72304			Occupations in tax consultancy – highly complex tasks		
	73234			Occupations in tax administration – highly complex tasks		
	73244			Occupations in the customs service – highly complex tasks		
Information and communications technology	25					
Software and applications developers and analysts	251	2511	43103	Occupations in computer science (without specialisation) – complex tasks		
			43104	Occupations in computer science (without specialisation) – highly complex tasks		

International Standard Classification of Occupations (ISCO-08)	ISCO-08	KldB 2010	German Classification of Occupations (KldB 2010)		
Software and applications developers and analysts – continued		43113	Occupations in business informatics – complex tasks		
		43114	Occupations in business informatics – highly complex tasks		
		43124	Occupations in computer engineering – highly complex tasks		
		43214	Occupations in IT-system-analysis – highly complex tasks		
		43224	Occupations in IT-application-consulting – highly complex tasks		
		2512	43102	Occupations in computer science (without specialisation) – skilled tasks	
			43103	Occupations in computer science (without specialisation) – complex tasks	
			43104	Occupations in computer science (without specialisation) – highly complex tasks	
			43114	Occupations in business informatics – highly complex tasks	
			43123	Occupations in computer engineering – complex tasks	
			43124	Occupations in computer engineering – highly complex tasks	
			43144	Occupations in geoinformatics – highly complex tasks	
			43413	Occupations in software development – complex tasks	
			43414	Occupations in software development – highly complex tasks	
		2513	43152	Occupations in media informatics – skilled tasks	
			43153	Occupations in media informatics – complex tasks	
			43154	Occupations in media informatics – highly complex tasks	
		2514	43102	Occupations in computer science (without specialisation) – skilled tasks	
			43123	Occupations in computer engineering – complex tasks	
			43124	Occupations in computer engineering – highly complex tasks	
			43412	Occupations in software development – skilled tasks	
			43423	Occupations in programming – complex tasks	
		2519	43323	Occupations in IT-coordination – complex tasks	
	Database and network professionals	252	2521	43353	Occupations in database development and administration – complex tasks
			2522	43343	Occupations in IT-system-administration – complex tasks
			2523	43104	Occupations in computer science (without specialisation) – highly complex tasks
				43123	Occupations in computer engineering – complex tasks
				43124	Occupations in computer engineering – highly complex tasks
				43314	Occupations in IT-network engineering – highly complex tasks

International Standard Classification of Occupations (ISCO-08)	ISCO-08	KldB 2010	German Classification of Occupations (KldB 2010)
Database and network professionals	2529	43383	Occupations in IT-network engineering, IT-coordination, IT-administration and IT-organisation (with specialisation, not elsewhere classified) – complex tasks
– continued		43384	Occupations in IT-network engineering, IT-coordination, IT-administration and IT-organisation (with specialisation, not elsewhere classified) – highly complex tasks
Service and Sales workers	51		
Cooks	5120	2930	Cooks (without specialisation)
		29301	Cooks (without specialisation) – unskilled/semiskilled tasks
		29302	Cooks (without specialisation) – skilled tasks
		29382	Cooks (with specialisation, not elsewhere classified) – skilled tasks
Waiters	5131	63302	Gastronomy occupations (without specialisation) – skilled tasks
		63303	Gastronomy occupations (without specialisation) – complex tasks
		63382	Gastronomy occupations (with specialisation, not elsewhere classified) – skilled tasks
		63383	Gastronomy occupations (with specialisation, not elsewhere classified) – complex tasks
Cleaning and housekeeping supervisors in offices, hotels and other establishments	5151	63293	Supervisors in hotels
		63393	Supervisors in gastronomy and system catering
		83212	Occupations in housekeeping – skilled tasks
		83213	Occupations in housekeeping – complex tasks
		83293	Supervisors in housekeeping and consumer counselling
Domestic housekeepers	5152	63293	Supervisors in hotels
		83143	Social care workers specialized in household assistance and family care – complex tasks
		83212	Occupations in housekeeping – skilled tasks
		83213	Occupations in housekeeping – complex tasks
		83293	Supervisors in housekeeping and consumer counselling
Personal care workers	53		
Child care workers	5311	8311	Occupations in child care and child-rearing
		83111	Occupations in child care and child-rearing – unskilled/semiskilled tasks
		83112	Occupations in child care and child-rearing – skilled tasks
Health care assistants	5321	81301	Occupations in nursing (without specialisation) – unskilled/semiskilled tasks
		82101	Occupations in geriatric care (without specialisation) – unskilled/semiskilled tasks
		83131	Pedagogic specialists in social care work and special needs education – unskilled/semiskilled tasks
Home-based personal care workers	5322	81301	Occupations in nursing (without specialisation) – unskilled/semiskilled tasks
		82101	Occupations in geriatric care (without specialisation) – unskilled/semiskilled tasks
		83131	Pedagogic specialists in social care work and special needs education – unskilled/semiskilled tasks

International Standard Classification of Occupations (ISCO-08)	ISCO-08	KldB 2010	German Classification of Occupations (KldB 2010)
		83142	Social care workers specialized in household assistance and family care – skilled tasks
		83143	Social care workers specialized in household assistance and family care – complex tasks
Skilled agricultural, forestry and fishery workers	6		
Field crop and vegetable growers	6111	11102	Occupations in farming (without specialisation) – skilled tasks
		11182	Occupations in farming (with specialisation, not elsewhere classified) – skilled tasks
		11193	Supervisors in farming
		11194	Managers in farming
		12102	Occupations in gardening (without specialisation) – skilled tasks
		12112	Occupations in fruit and vegetable farming – skilled tasks
		12193	Supervisors in gardening
		12194	Managers in gardening
Gardeners, horticultural and nursery growers	6113	11722	Occupations in landscape preservation – skilled tasks
		12102	Occupations in gardening (without specialisation) – skilled tasks
		12122	Occupations in tree, perennial and ornamental plants farming – skilled tasks
		12132	Occupations in cemetery gardening – skilled tasks
		12133	Occupations in cemetery gardening – complex tasks
		12142	Occupations in horticulture, landscape gardening, and sports field maintenance – skilled tasks
		12143	Occupations in horticulture, landscape gardening, and sports field maintenance – complex tasks
		12193	Supervisors in gardening
Livestock (excluding poultry) and dairy producers	6121	11212	Occupations in livestock farming (without poultry farming) – skilled tasks
		11213	Occupations in livestock farming (without poultry farming) – complex tasks
		11293	Supervisors in animal husbandry
		11294	Managers in animal husbandry
		11302	Occupations in horsekeeping (without specialisation) – skilled tasks
		11312	Occupations in horse breeding – skilled tasks

Source: Federal Employment Agency 2015

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Referat 230
Frankenstraße 210
90461 Nürnberg
www.emn-germany.de
E-Mail: emn@bamf.de

Author:

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