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ABSTRACT

How Could Germany Escape the Demographic Trap?

Demographic change is perceived as a threat for wealth rather than a challenge in Germany. The debate on skilled labor shortage is a proof for this view. The paper surveys the most important German studies on skilled labor shortage. Meanwhile, a consensus on solutions has emerged in academia. Increasing the participation rates of elderly, women and facilitating qualified immigration as well as improving productivity are the mainstream recommendations. The paper provides descriptive statistical evidence that temporary agency work could contribute to solve the skilled labor shortage problem via these four channels. However, it is far from clear that productivity increases are the most important and most sustainable way out of the demographic trap. Against this background the government's demographic strategy is assessed. It turns out that the government has not a coherent strategy yet to solve the demographic issues ahead.

JEL Classification: I2, J2, J4

Keywords: demography in Germany, qualification, training, temporary agency work

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Summary

After Japan, Germany is the nation in the world most affected by demographic change. The combination of high life expectancy and a low birth rate leads to a “demographic trap.” Recently, public discussion has intensified on the subject of the most important harbinger of demographic change: the lack of skilled labor. This discussion is generally marked by anxiety about the future. How will Germany maintain its high standard of living as its workforce decreases in number and there are ever fewer skilled workers available?

Yet the economic crux of the challenge is largely ignored: demographic change leads to a productivity problem. Today, 100 workers must work to supply the needs of about 34 elderly persons, but by the year 2040, those same 100 workers will have to provide for 62 elderly persons. Accordingly, future workers will have to be significantly more productive in order to prevent a decline in the principal indicator of prosperity – per capita GDP.

Does the demographic strategy pursued by Germany’s government in 2012 reflect this central challenge? Only to a certain extent. Indeed, by now there is broad consensus in the academic literature and politics that the labor shortage now emerging as a harbinger of demographic change can be offset through higher participation rates among older workers and women and by the increased immigration of qualified workers. Yet the insight that increased productivity represents the most important and most sustainable way out of the demographic trap is not widespread at all.

The core message of this paper is that qualification – in the form of lifelong learning – is a central driver of increased productivity and, by extension, the solution to escaping the demographic trap. Labor productivity can be increased through qualification, and capital productivity increased by innovation. Qualified personnel are the essential precondition for an innovative economy. It is innovation that leads to economic growth. Therefore, all institutions engaged in education and further training must orient their efforts to the path of sustained economic growth. If this is successful, then Germany will meet its demographic challenge without a decline in prosperity.

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1 Introduction

Contrary to all fears, the economic and financial crisis has left scarcely any traces on the German labor market. Never before have so many people been working in Germany and the last time the unemployment rate was just 18 years ago as low as in 2011. Unemployment is low among young people and the proportion of the long-term unemployed has also fallen significantly. Full employment prevails in a number of regional labor markets, such that it is difficult to fill vacancies (see Federal Employment Agency 2011a,b).

Against this background, there are structural problems evident in the labor market. The new danger to the German labor market is the "skilled labor shortage", a veritable buzzword in Germany at present. This notion always has a negative connotation. Without skilled workers, it is frequently said, the German economy cannot grow, and without skilled workers, Germany will become poorer in the medium term. One regularly hears complaints from associations and companies about the lack of skilled labor, especially in what are known as the MINT fields (Mathematics, Informatics, the Natural Sciences and Technology, and thus the acronym also includes engineers) (see Institute for German Economic Research 2011 and Anger et al. 2012). In addition, bottlenecks exist in the training market, as there are fewer applicants than there have been in a very long time (see Autorengruppe Bildungsberichterstattung 2012).

Some labor market economists regard the lack of skilled labor as a central problem (see Zimmermann 2010). Others believe that this problem will be solved by the full freedom of movement granted as of 1 May 2011 to workers in Central and Eastern European nations that joined the EU in 2004 (see Sinn 2011). There is general consensus that skilled labor shortage does not exist nationwide today; instead, there are branch-specific and regional bottlenecks (see Brenke 2010, Fuchs and Zika 2010).

Upon closer scrutiny, the lack of skilled labor is one of the first perceptible consequences of demographic change. Visionary thinkers such as Kurt Biedenkopf and Meinhard Miegel (1982) were already suggesting such a connection decades ago. In Germany they were both regarded as premature alarmists. In the US, the Hudson Institute has issued similar warnings, arguing that as the baby-boom generation retires, there will be major problems for economic growth (given continuing low birth rates) because of a lack of skilled and specialized workers (see Freeman 2006).

German economists began to grapple early on with the connections between demographic change and the labor market. For example, the Mannheim Research Institute for Economic and Demographic Change (MEA) (now known as the Munich Center for the Economics of Aging) was founded in 2001. The German Council of Economic Experts had addressed this issue as well, publishing in 2011 a report titled the "Challenges of Demographic Change" (Sachverständigenrat 2011). The core message: due to improved health care and better nutrition, the German population is becoming older. At the same time there is a low birth rate, particularly on account of high income levels and a strong social net. The consequence is that the population is aging and diminishing in numbers – with a falling potential labor force. When looked at in global comparison, Germany is especially hard hit by this phenomenon; only Japan is more challenged. As the high birth rate and well-educated generation born in the fifties and sixties and is no longer available to the labor market, demographic change will intensify the shortage of skilled labor. In addition, we need to consider the inexorable structural transformation that is taking place toward a service economy. During the most recent economic and financial crisis, the service sector continued to grow, even in those regions most affected by crisis. Many national and international studies predict continued growth in the financial services and temporary employment sectors, and especially in health care (see Sachverständigenrat 2011, and 2008, Gratton 2011). At the same time, the crisis has demonstrated that a nation with a strong industrial core and great international competitiveness – such as Germany – can be very resilient in the face of crisis (see Fuchs et al. 2010). An expanding service sector creates a different set of requirements for worker skills. In addition to specific knowledge in one's field, what are known as "soft skills" become especially important. Yet the education and further training system has not yet adequately adjusted to the requirements of the labor market.

Another irreversible trend is that of economic globalization. International trade in goods and services has led to major changes in the labor market (see Stiglitz 2006). As an exporting nation, Germany is dependent on international trade – and profits greatly from globalization (see Sachverständigenrat 2006). Highly skilled workers enable German industry to be highly competitive. Without globalization, the export economy would be smaller and there would be less need for skilled workers.

Finally, innovations in industrial and information technology have a fundamental impact on the labor market. Automation increases productivity, and therefore leads necessarily to a lower demand for unskilled workers. Simple routine tasks can frequently be replaced by intelligent technologies – but only if this makes economic sense. Thus, machines can perform physical tasks more productively than people (especially in agriculture and industry),

but white-collar activities with a large proportion of routine tasks (especially in the banking industry) could also become automated (see Spitz-Oener 2006). Lower demand for unskilled workers is also driven by the outsourcing of simple tasks to less expensive countries abroad, a shift made possible by information technology. These changes all increase the relative proportion of highly skilled jobs in Germany. As a consequence, a dual labor market is developing, with unemployment in the area of unskilled work and a labor shortage for skilled and highly skilled workers (see Autor et al. 2006, Sachverständigenrat 2008).

This paper focuses on the connections between demographic change and the labor market. It specifically examines whether qualification could contribute to managing demographic change. In Chapter 2, we will summarize the findings of the most important academic studies on the harbinger of demographic change – the shortage of skilled workers. In Chapter 3, we will examine qualification in the form of lifelong learning as a key strategy and describe the contribution made by temporary employment to solving the skilled labor shortage. In Chapter 4 we will critically examine the German government's demographic strategy against the background of the analyses described above. Chapter 5 will present a summary and outlook for the future.

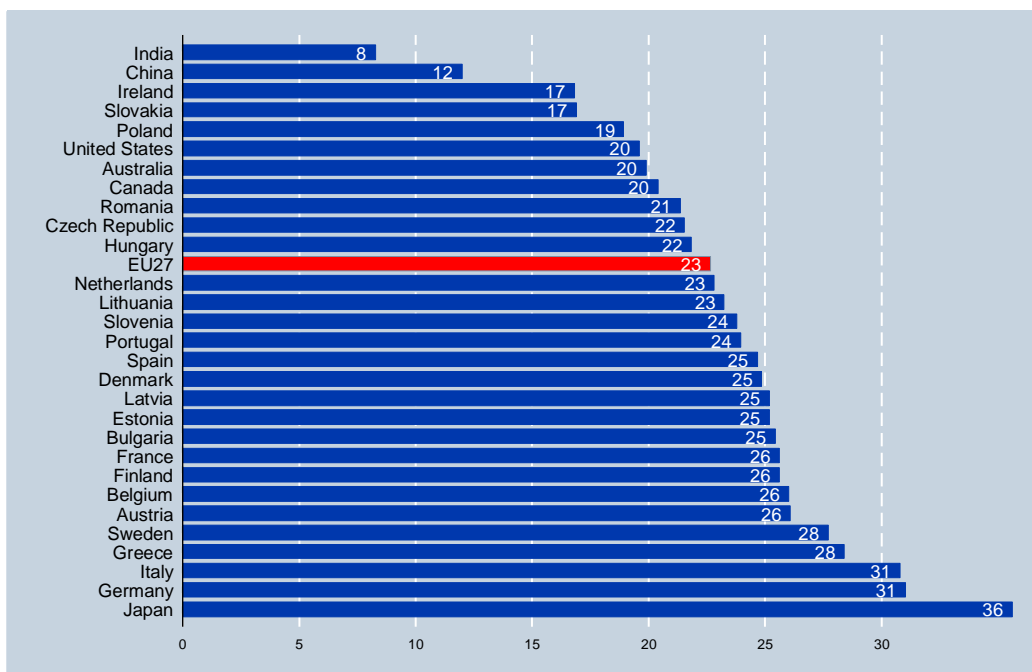
2 A harbinger of demographic change: the skilled labor shortage

2.1 The demography trap

No study about Germany's future can avoid the issue of demographic change. The central problem is that the average age of Germans is increasing – with the consequence that there is a rising proportion of the grey force/best agers/Generation 50-plus, or whatever the euphemism of the moment for this group. For the leading management thinker Peter Drucker, the dramatic increase in life expectancy is actually the critical change of the 21st century – even more significant than technological progress or globalization (see Drucker 2008).

Figure 1 shows that Japan, Germany and Italy are the three nations with the greatest demographic challenges as of 2010:

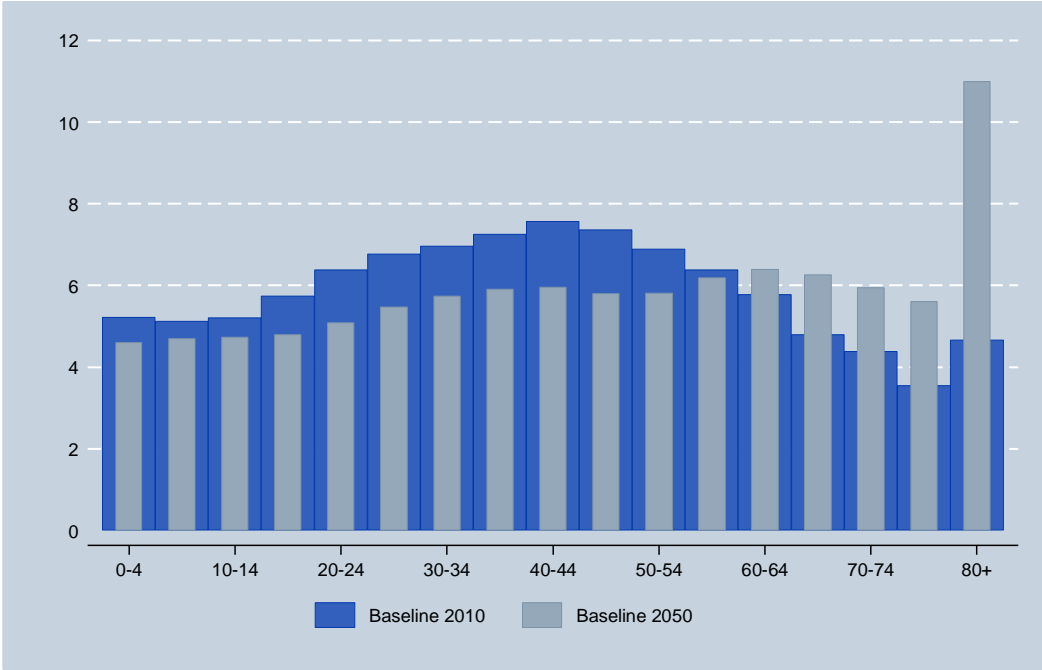
Figure 1: Proportion of older persons (65+) in the working population in 2010 (grey rate = age ratio)



Source: Berkhout et al. (2012), p. 192.

Yet, an aging population is not an issue only for these three countries but for all of Europe, as illustrated in Figure 2.

Figure 2: Age distribution in the population of the EU-27 states (2010 in comparison to 2050)



Source: Berkhout et al. (2012), p. 193.

These two figures provide crucial insight into the issue of demographic change. They illustrate two changes, which on their faces seem to be welcome developments. First: We are living progressively longer due to good nutrition and medical care; second: since we live in a wealthy nation with well functioning pension insurance, fewer children are born.

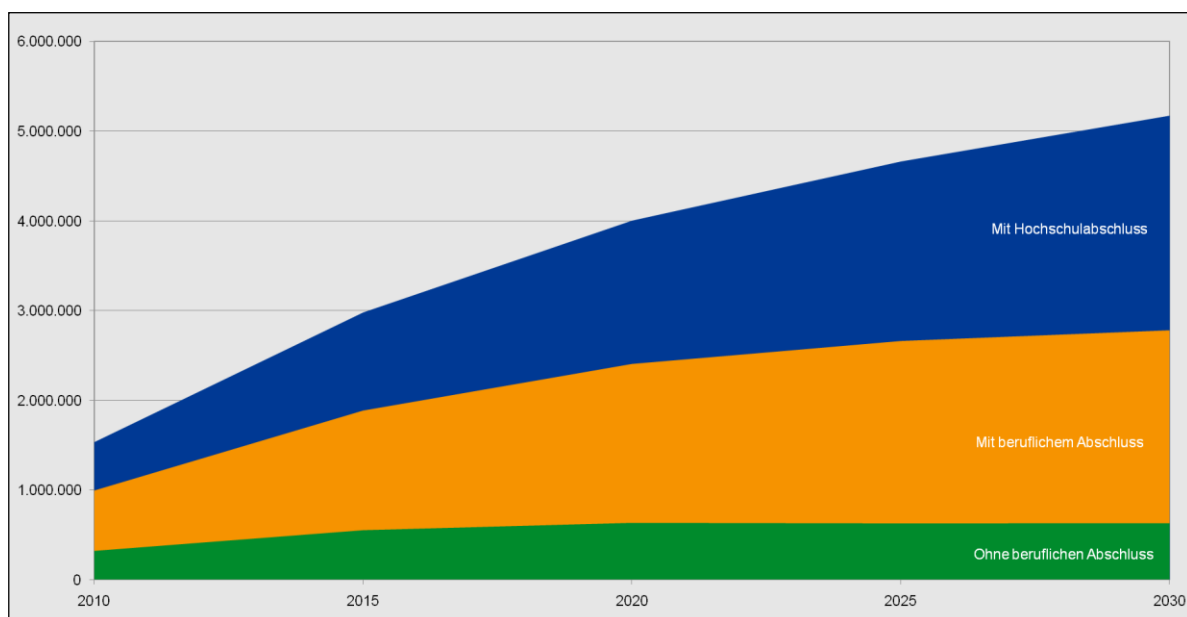
However, the combination of rising life expectancy and falling birth rates is leading us toward what has been termed the demography trap. Currently, it is especially the shortage of skilled labor that has been the focus of discussion as a harbinger of demographic change. As the following analysis of recent scientific studies reveals, dealing with the core problem has been postponed for years. To the extent that more elderly people are working, more women are working in more highly skilled occupations, and more skilled immigrants are employed, the challenge of demographic change has become less pressing. Yet, the time will inevitably come when higher participation rates and augmented immigration alone will no longer suffice to meet this challenge.

2.2 Studies on the skilled labor shortage

2.2.1 The Prognos study

The Swiss research institute Prognos has calculated that by 2030, Germany will have a labor gap of approx. 5.5 million individuals, assuming that there is net immigration of 300,000 persons per year (see vbW 2008). Should this level of immigration fail to occur, the gap will increase to more than 7 million workers. According to Prognos, the greatest deficit in the labor force will be for highly skilled personnel (individuals with a college degree). In 2030 there will be a shortage of 2.4 million persons just in this category alone. The Prognos study does not predict comparably strong demand for workers with vocational degrees. Here, the labor shortage will total approx. 2.15 million persons. By contrast, it estimates that the shortage of untrained workers will remain relatively constant. In 2030, this is expected to be only 600,000 persons (see Figure 3).

Figure 3: Labor gaps in Germany according to qualification



Source: Vereinigung der Bayerischen Wirtschaft e.V. (2008): Arbeitslandschaft 2030, a study by Prognos AG

Assuming no fundamental change in conditions as they exist today, Prognos AG predicts that as a consequence of the shortage in skilled workers, the rate of growth in the GDP will be cut in half by 2030. This would represent a cumulative loss of wealth of 4.6 trillion euros. Per capita GDP would thereby be 4,000 euros smaller than in a labor market without a shortage of workers. If one take into consideration (as illustrated in the graph above) that the

shortage would primarily consist of college graduates, who tend to have very high rates of productivity, the loss of wealth as predicted by Prognos might even grow as high as 5.2 trillion euros.

However, the Prognos study indicates that these problems are potentially solvable. Based on two guiding principles – namely, flexibilization of the labor market and boosting the labor force participation rate – the institute suggests four action areas:

1. Greater flexibility in changing career tracks; that is, the ability of workers to change fields and jobs must become easier. This change alone would reduce the gap in skilled workers by 1.25 million persons.
2. Increase of the working week to 40 hours, which would reduce the gap by 1.6 million persons.
3. Greater labor market participation, especially by women and the elderly. This measure would cut down the labor shortage by 1.4 million persons.
4. Greater educational participation could close the gap by 1.2 million persons.

In their summary, the researchers at Prognos underscore the necessity of introducing several of these measures without delay. The need for quick action applies especially to interventions that take some time to achieve their effect, such as changes in the educational system. Increasing the participation rate or extending weekly working hours could generate successful results even in the relatively short term.

2.2.2 Study by the Federal Employment Agency

According to a study by Germany's Federal Employment Agency (BA), by 2050 the potential workforce in Germany will fall to just 27 million persons due to demographic change (see Bundesagentur für Arbeit 2011a). The potential workforce includes those individuals who are employed, the unemployed, and the hidden labor reserve (see Fuchs/Zika 2010). The decline in the potential workforce will begin gradually but then accelerate from 2020 on as the baby boom generation retires. By the mid-2020s, the Federal Employment Agency predicts there will be approx. 6.5 million fewer employable individuals than today – with a fall in actual employment of approx. 500,000.

In its study, the Federal Employment Agency points out that it is not possible to calculate the gaps in the labor force in terms of the number of persons who are unemployed. For one thing, there are always a certain number of persons who are only unemployed very briefly, whether because they are just about to begin a new job or are just about to retire. For another, movements in the labor market also tend to be quite different in different regions. In this respect, there is often a mismatch between the jobs that are offered and the available labor force, for whatever reason. The study states that this mismatch "is a structural problem of the labor market, which actually increases during cyclical periods of economic growth" (see Bundesagentur für Arbeit 2011a, p. 6).

Therefore, establishing the existence of a gap in the workforce does not necessarily mean a corresponding number of vacancies. The risk of chronic underemployment can also occur during times of labor shortage, especially a shortage in skilled labor. This is the case because if companies cannot find qualified personnel, this has a direct impact on their willingness to invest. They eliminate new job creation, which includes jobs for less skilled individuals, and growth is slowed or can even turn negative. Ultimately, similar to the predictions by Prognos, the consequence is a loss of wealth for everyone. The Federal Employment Agency suggests that there are two potential responses to this quantitative and qualitative lack: first, to increase the numbers of employed individuals, and second, to increase the amount of value created through their work.

The goal of increasing the number of employed individuals, according to the Federal Employment Agency, can be achieved by increasing the labor force participation rate for persons already living in Germany and through increased immigration. In this respect, the emphasis on the part of the Federal Employment Agency in this double strategy is clearly on better utilization of domestic labor potential (see Bundesagentur für Arbeit 2011c). Value creation can primarily be augmented through more qualification and better use of individual

performance potential. Expansion of working hours and more transparency regarding supply and demand in the labor market could also contribute to this process. In brief: according to the Federal Employment Agency, the goal must be to increase the potential workforce and to utilize that workforce in a qualitatively better way.

In its study, the Federal Employment Agency BA describes a total of ten areas for action:

1. Reduce the number of persons leaving school without graduating
2. Reduce the drop-out rate in training programs
3. Reduce the drop-out rate in universities
4. Increase labor force participation for persons over 55
5. Increase labor force participation for women (including raising the working hours for part-time employees)
6. Encourage the immigration of skilled workers
7. Increase working hours
8. Move forward with training and qualification programs
9. Increase transparency in the labor market
10. Review taxes and social-insurance contributions

The Federal Employment Agency emphasizes that the broader the range of approaches and the more inclusive the involvement of important actors, the better the nation will be able to deal with the shortage of skilled labor. Consequently, we can best combat the shortage of skilled labor by combining all of the factors named thus far. This also means starting from a broad social consensus, where each of the individual actors will have to pull its weight.

2.2.3 The Randstad studies “Bridging the Gap” and “Into the Gap”

A 2010 study sponsored by Randstad also addresses the shrinking labor market resulting from demographic change. However, this study took a wider view, examining all of the EU 27 nations in addition to Germany (see Berkhout/van den Berg 2010: Bridging the Gap). Updated results with a focus on the year 2020 can be found in the “Into the Gap” study by Berkhout et al. (2012).

The Randstad studies take as their point of departure the employment goals agreed upon by the EU member states in 2000. These goals include a maximum unemployment rate of 4% and an average labor force participation rate of at least 70%. As of mid-2009 only the Netherlands, Denmark, Sweden, Germany and Austria had achieved the labor force

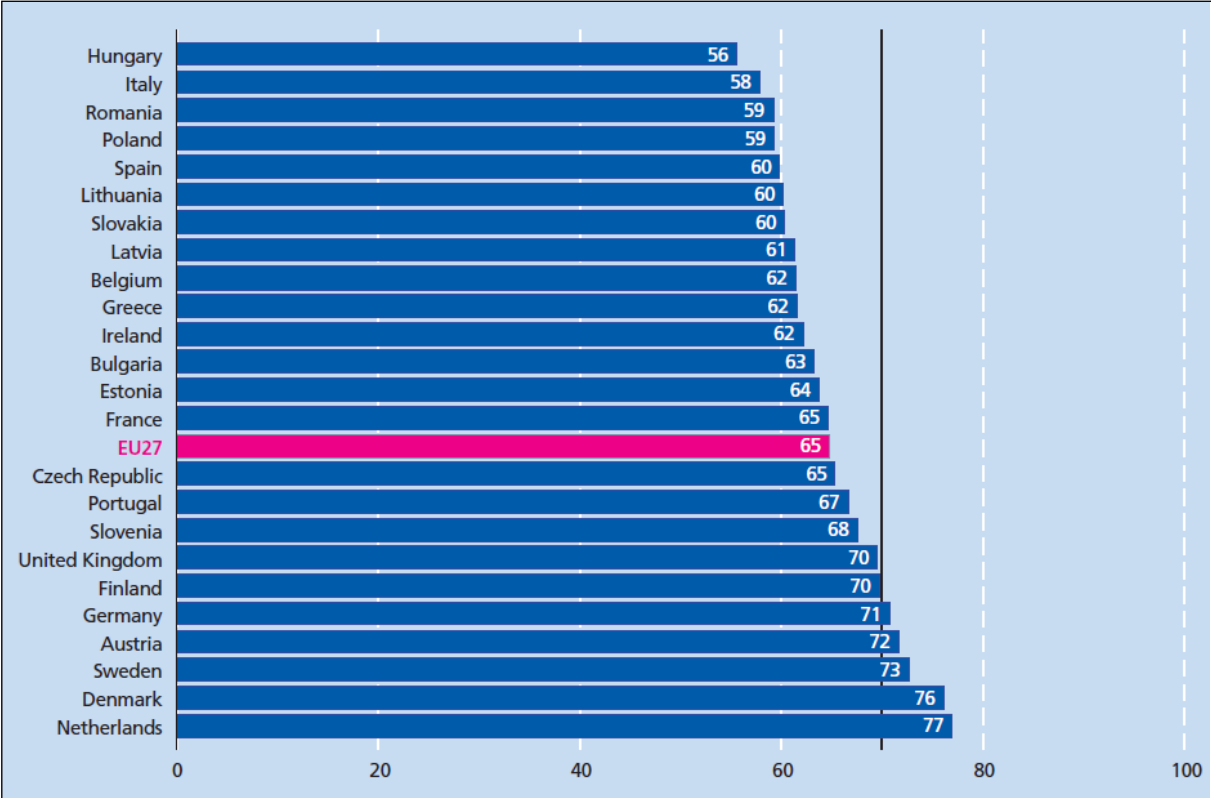
participation rate target of 70% (see figure 4). Other nations that were close to achieving the target fell back as a result of the 2008–9 economic crisis.

The authors estimate an employment gap of 35 million persons for the EU-27 states in 2050, assuming continued immigration from other nations.

The authors see four basic areas for action for closing the employment gap:

- 1. Increase the labor force participation rate
- 2. Raise (real) productivity
- 3. Reduce local demand for labor
- 4. Promote migration

Figure 4: 2009 labor force participation rates in European nations



Source: Berkhout, Ernest / van den Berg (2010)

The authors specifically advocate setting aside institutional obstacles that stand in the way of increasing the participation rate for older persons and for women. They suggest that these obstacles are also a problem in Germany (e.g. mandatory retirement age, matrimonial

splitting). In addition, the authors of the reports find it noteworthy that the participation rate among unskilled workers is “extremely low” (Berkhout/van den Berg 2010, p. XVII). In this regard they ascribe particular importance to the issue of qualification.

In addition, the study just cited favors flexible forms of employment such as time-restricted employment, temporary agency work, and self-employment. Following the Scandinavian model, the authors expect that “voluntary temporary work” will play a major role in raising the participation rate. Among the various forms of atypical employment, they ascribe an especially important role to part-time work. Part-time work is very largely the province of female employees. According to the study, atypical employment is a phenomenon mostly occurring in the older EU states, and is currently still underdeveloped in the Eastern European states, with the exception of Poland.

According to the authors, an orientation to unrestricted full-time employment contracts that include a high level of protection against dismissal – still regarded as the standard in Germany – leads to segmentation of the labor market into what are seen as “insiders” and “outsiders.” Against this background, the study concludes that employment protection rules need to evolve so as to “reciprocally amplify flexibility and security in a functional way without enhancing the immanent tendencies for segmentation of the labor market” (Ibid. p. XVIII).

An update of the quantitative mismatch lead to the conclusion that the size of the employment gap will be smaller so that the skilled labor shortages will be postponed. This is mainly a result of the financial and economic crisis where labor market conditions have changed significantly (see Berkhout et al. 2012, p. XI).

2.2.4 The Bertelsmann Foundation study

The Bertelsmann Foundation has also been engaged in studying the potential economic consequences of our aging society (see Bertelsmann Stiftung 2011). The authors of this study propose the thesis that the consequences of aging have been systematically underestimated. Assuming unchanging conditions, they suggest that Germany will face GDP losses as soon as the mid 2020s.

The study does not limit its focus to Germany, but reviews the old EU states (EU-15), the US, Japan, India and China (19 nations in total). The study takes as its point of departure the principle that a society’s age structure has a broader impact on national economic growth than raw population figures. Even if all of the reciprocal effects are not yet fully

understood, the study suggests that as the numbers of elderly persons increase, this can have long-term effects on demand patterns for consumer goods and services along with an impact on the accumulation of savings, as well as inflation and productivity growth.

What is worth noting in the Bertelsmann Foundation study is that it predicts an increase in the proportion of elderly persons in all of the nations examined, even if this increase is not of the same magnitude everywhere. Not least for this reason, the study predicts “a fall in the long-term rate of real economic growth” for all of the nations listed. The forecast is that over half of the economies in the study – including Germany’s – will even have to confront declining GDP.

The impact of GDP on people’s actual prosperity may be a matter of contention (in this regard see Stiglitz et al. 2009). However, it is clear that the GDP directly affects the financial situation of a state. The lower the GDP, the lower the national income. If we now consider the fact that in a society with an ever-increasing number of elderly persons, government expenditures for health, welfare and pension insurance will all tend to increase, it becomes apparent just how much explosive force demographic change can have for the social welfare state.

As in the other studies cited, the authors of the Bertelsmann Foundation study look to the labor market as the most important area for intervention. Expansion of working hours and working life, increasing employment participation, increasing productivity, and immigration – this is their (by now familiar) list of prescriptions.

2.2.5 Expert Report by the German Council of Economic Experts

The 12th population forecast by the Federal Statistical Office, cited by the German Council of Economic Experts in their 2011 report (see Sachverständigenrat 2011) concludes that Germany’s population will be 24 million persons less than it is today (given net migration of zero and an unchanging birth rate of 1.4 children per woman in 2060). This would lower the labor force potential by nearly a third – from approx. 43 million to 31 million individuals. Thus, demographic change leads in the first instance to a shrinking labor supply. According to the expert report, the magnitude of the decline in the size of the labor force will be between 18 to 36 percent. Here again, there are indications that a reduction in the labor supply would not necessarily be associated with falling unemployment.

Regardless whether the actual figures ultimately match the predictions, it is obvious that such changes in the population structure toward aging and shrinkage in numbers will have major economic effects. In terms of government budgets, for example, the authors of the

report suggest that changes on the income side will maintain a relatively stable ratio to the GDP. However, on the side of government expenditures, they predict a "sustainability gap" amounting to 3.1% of the GDP, essentially as a result of the increased social expenditures for an aging population such as pensions, health care and nursing home care.

Changes in total population and age structure will also have a major impact on labor productivity. Whereas a shrinking population may have a purely quantitative effect at first, the consequences of an aging society are of a structural nature. Both of these changes will slow economic growth during the following several decades or even result in negative growth. However, such negative growth might be compensated, at least in part, by technological progress and an expansion of capital stock.

The two factors with the greatest effects on the development of production potential are immigration and the general education level of the population. Therefore, particularly with respect to the influx of people from countries outside the EU, the experts recommend a "change of strategy in immigration policy." Thus, following the example of nations such as Australia, New Zealand and Canada, Germany could establish a point system to encourage larger numbers of highly qualified skilled workers from outside Europe to come to Germany. Of course, this would require a nation-wide system for recognizing degrees earned abroad. The point system could be accompanied by more intensive advertising for young talent from abroad. After completing their basic studies at home, they could come to Germany for advanced studies and once these were completed, take on a job in Germany equipped with greater productive capacity.

The experts envision an urgent need for action in the area of education. The issue in this realm is to remedy two principal defects in the educational system: our relatively modest level of educational achievement compared to other nations, and the inequality of existing educational opportunities. Key points of intervention for the educational system are support for early childhood education, the introduction of an obligatory preschool year and the comprehensive institution of all-day schools.

Further measures that the Council of Economic Experts regards as appropriate for meeting the challenges of demographic change are to raise average working hours, in part by expanding full-time employment (especially for women), to prolong employment years and to increase the overall labor force participation rate. The last of these once again pertains especially to women, but also to older workers and immigrants. Their participation rates are lower than the overall rate for Germany.

2.2.6 Expert Report by the Cologne Institute for Economic Research

According to a study conducted by the Cologne Institute for Economic Research (IW), by 2060, there will be only 30 to 36 million individuals in the age group between 20 and 65 counted as fit for employment. If the real retirement age were to increase to 67 years, these numbers would only rise modestly from 34 to 38 million (see the Cologne Institute for Economic Research 2011).

To counteract this decline, the IW proposes a three-pillared strategy for shoring up the skilled labor supply: Minds, Time, and Productivity. A number of specific measures are enumerated based on this "triad," which partially corresponds to the proposals in the previously cited studies.

Under "Minds," the objective is first and foremost to increase both the birth rate and net immigration. To raise the birth rate, according to the IW, the primary effort must be a better accommodation of work and family life. Above all, this would mean expanding the necessary infrastructure (child care establishments, all-day schools, etc.). Whereas raising the birth rate would only have effects over the long term, increasing net immigration could have positive short term effects as well. Of critical importance, according to the IW, would be to change the rules for immigration. For one thing, this would mean promoting qualification-oriented immigration (e.g. by using a point system), and for another, it would mean changing the residency rules for foreign college graduates.

"Time" is the second pillar proposed by the IW. Working time could be increased by raising annual hours worked, lifetime hours of work, as well as by increasing the participation rate. While average annual working time in Germany is significantly below the OECD average, due among other things to the large numbers of German workers in part-time employment, things look better from the perspective of lifetime hours worked. The participation rate for older persons (55 to 64 years of age) has reached a level well above the average in most other European states. Measures that could continue to promote this process include raising the retirement age to 67 years of age and arranging for earlier entry into working life – for example, by reducing the number of years of education.

Increasing the participation rate is an issue primarily related to the sub-group of women. While the participation rate for German women has certainly risen significantly during the past ten years, it still remains far below the level achieved in Scandinavian nations, and this also ignores the large share of women in part-time work. All of the action proposals under the pillar of Time could have short-, mid- and long-term effects.

The third and final pillar proposed by the IW is "Productivity." This can be subdivided into the following action categories: "reducing inadequate education," "easing the path to higher qualification," "improving access to the labor market for migrants living in Germany," "facilitating lifelong learning," and "increasing innovation." In the first action category the issue is to assure greater permeability between schooling, vocational training and university education. Central to the better integration of migrants in the German labor market is the question of recognizing degrees earned outside Germany. Acting on these proposals could begin to have effects even in the short term. To facilitate lifelong learning, the IW suggests improving the required infrastructure, not least inside firms. The same applies to "increasing innovation." This proposal is primarily directed at increasing Rand D investment and, similar to lifelong learning, would have mid- to long-term effects.

2.2.7 The ZEW Study

In a brief expert report, economists at the Centre for European Economic Research (ZEW) quantified the potential gains in value creation that would result from interventions to adjust the parameters of working hours, employment of older workers/women, and migration (see Kappler et al. 2011). The ZEW study used as a starting point a scenario of demographic change that would make 2.5 million fewer persons available to the labor market by 2025. If the labor market participation rate and the rate of full-time employment rose all the way to Swedish levels by 2025, the potential gain in value creation would amount to 986 billion euros when compared to the reference scenario.

2.3 Interim findings

According to all the studies presented, the shortage of skilled labor already beginning to confront us today will only intensify in the future because of demographic changes, structural change, progressive globalization and technological progress, especially in information technologies. These changes will be accompanied by a growing overall labor shortage. The combination of a quantitative and qualitative gap in the workforce will have major economic effects – especially on the growth of the German national economy, but also on the labor market and the social security system, and thus on the future financial strength of our country. This conclusion informs all of the most important academic studies about this subject.

Past studies are also in broad agreement about how to resolve the workforce problem: they all suggest increasing the labor force participation rate, especially among older workers and women. While Germany made rapid progress in this area to catch up with other nations as part of the EU's 2000 Lisbon Strategy, the gap between Germany and leading EU states such as Sweden remains large (see OECD 2011b). Immigration, specifically of skilled workers, is also proposed as a solution. Clearly, the demographic problem would worsen significantly without immigration. Finally, virtually all the studies suggest increasing productivity as a potential solution, and to accomplish this, they emphasize the role of improved education and training. Table A1 in the appendix summarizes the most significant findings in the studies.

3 Qualification as the key solution

According to the solutions proposed in past studies, the shortage of skilled labor could be ameliorated and at least temporarily postponed by increased rates of employment and immigration. Paradoxically, the financial and economic crisis has bought us additional time – according to current forecasts, problems will manifest later, but we must recall that they have certainly not gone away (see Berkhout et al. 2012). Anyone who soberly considers the solutions that have been proposed will quickly recognize their limitations: labor force participation rates may increase, but 80% would appear to represent a natural ceiling (see OECD 2011b). Immigration may increase, but what would motivate hundreds of thousands of qualified skilled workers to accept Germany's invitation? Once these limited solutions are exhausted, the heart of the workforce dilemma will quickly become apparent.

To state things simply: It's a good thing that we are becoming older and staying healthy longer thanks to better nutrition and medical progress. Furthermore, there is no reason to be concerned about the rapid transformations that are leading to the development of a service-based economy. It's also not such a problem that despite immigration, fewer people will be living in Germany due to our low birth rate.

Ultimately, the *core of the problem* is that the ratio between our senior citizens and the working age population has deteriorated dramatically. In concrete terms, by 2060, the old-age ratio is going to increase from its current level of about 34 all the way to 67 (see Table 1).

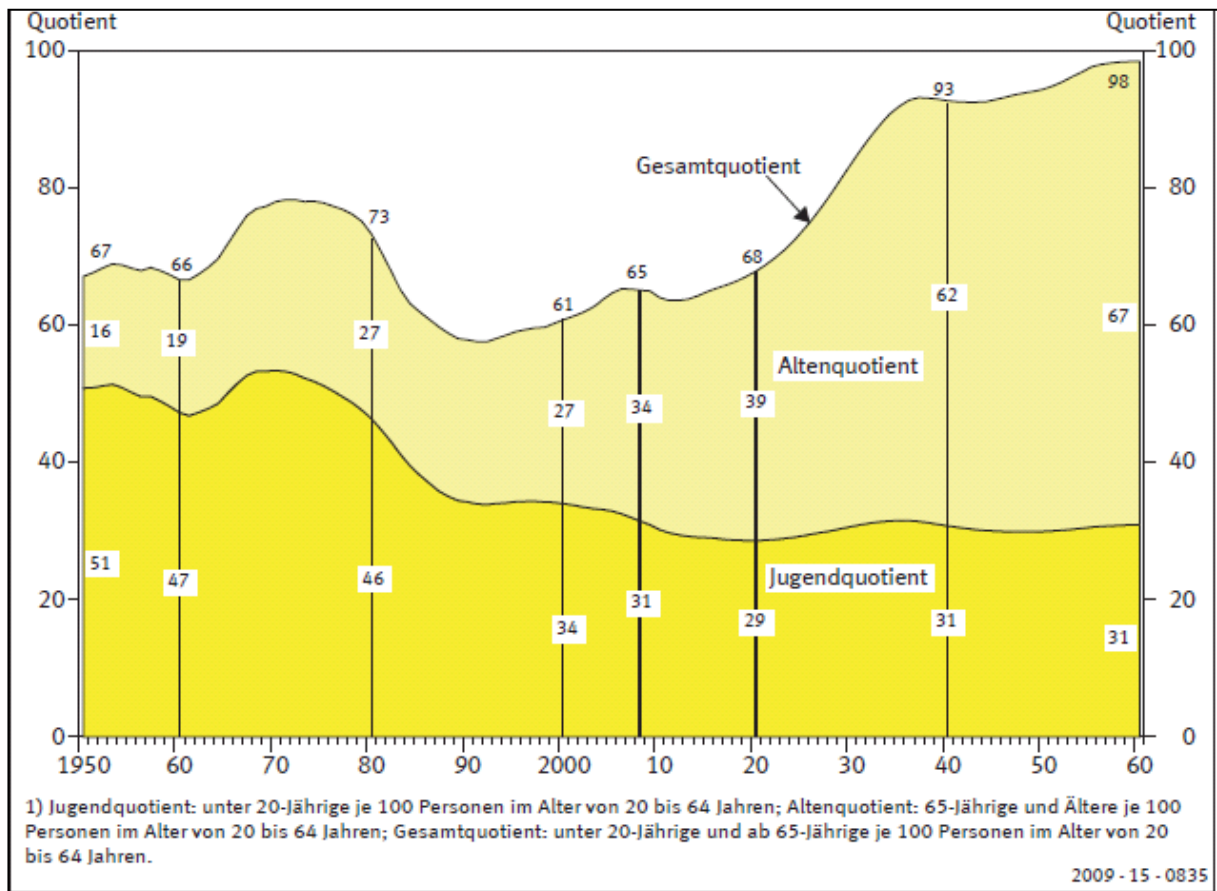
Table 1: Old age ratio in 2008 and 2060 in comparison

Year	2008	2060
(1) Population level	82.00 Million	65.65 Million
(2) 20- to under 65-year olds	49.66 Million	32.59 Million
(3) over 65 years old	16.73 Million	21.98 Million
(4) under 20 years old	15.62 Million	10.09 Million
(5) Age ratio $100 \times \frac{(3)}{(2)}$	34	67

Source: Federal Statistics Office (2009)

The steep rise in the old age ratio from 34 in 2008 to 62 by 2040 is the headline figure (see Figure 5). As a result, 100 persons who are employed in 2040 will have to finance the care of nearly twice as many elderly persons as they would have had just thirty years before. This dramatic shift is attributable to the exit of the baby boom generation from the work force in the 2030s. Therefore, the future labor force will have to work much more productively in order to keep the key indicator of prosperity – per capita Gross Domestic Product – from falling. This is the fundamental insight for understanding the demographic challenge.

Figure 5: The old age ratio (1950–2060)¹⁾



Source: Federal Statistical Office (2009)

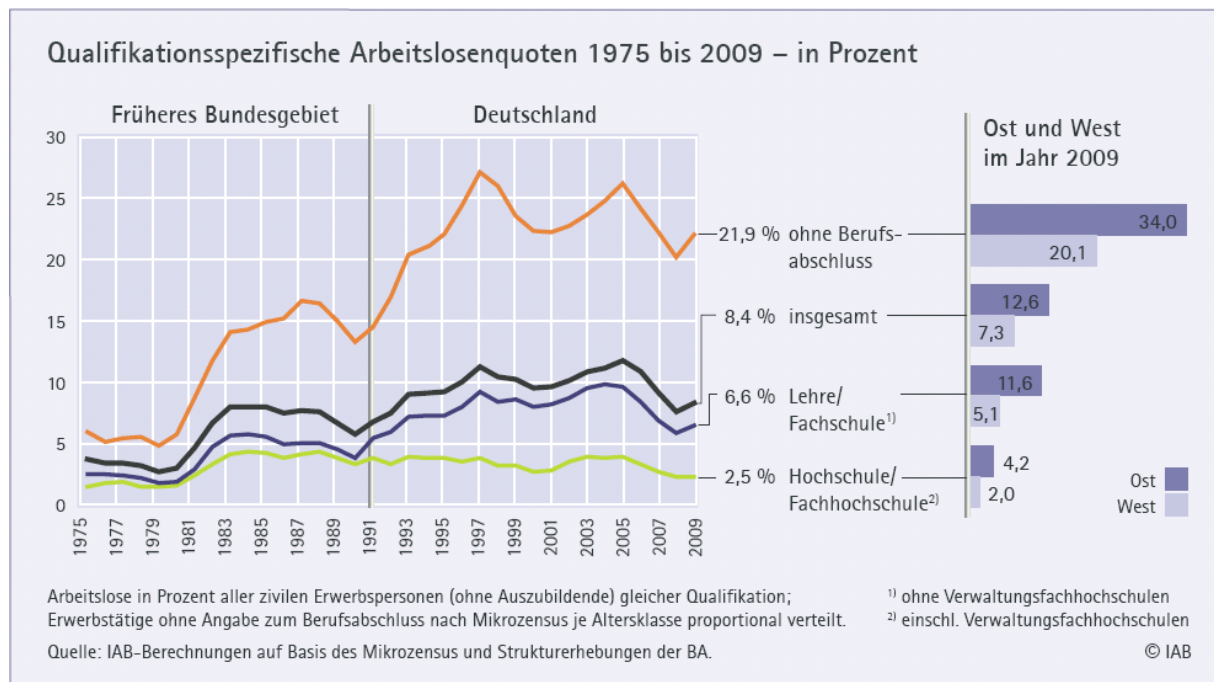
What needs to be done to increase productivity?

The one-sentence answer: We have to increase labor productivity, capital productivity and the synergy between labor and capital productivity through education, innovation and modern institutional frameworks (see Acemoglu 2012, Boeri/van Ours 2008 on the importance of political and economic institutions for prosperity). Essentially, what is required is a growth agenda of a sort already being developed by academic experts ten years ago (see Sachverständigenrat 2002), an agenda called for by international institutions in various forms every year (see OECD 2012, Council of the European Union 2012, International Monetary Fund 2012).

Is a good education enough?

Education is the best insurance against unemployment – regardless of the economic cycle. The truth of this claim for Germany is visually demonstrated if we look at Figure 6.

Figure 6: Unemployment rates as a function of educational attainment (1975-2009)



The figure provides evidence from the experience of the past 35 years to confirm the promise that a good education is the best insurance against unemployment. And one should add: the better the education, the greater one's work productivity, and, accordingly, the higher one's relative wages and the more rapidly those wages will increase. However, the chart does not prove that these basic insights about the labor market economy will continue to be similarly valid for the next forty years.

It is evident that the world of work is undergoing an upheaval today, thanks to technological progress, globalization, demographic change, and energy shortages. In the course of this process, millions of individuals are being thrust into the global talent pool in a very short period of time – the labor supply has risen dramatically (see Gratton 2011). The half-life of knowledge has shortened radically; thus, primary training and education are losing importance relative to further training. Until now, educational institutions have not been ready for these changes. Today, obtaining a good education no longer suffices as long-term protection from unemployment. Permanent continuing education in the form of lifelong learning will become ever more important for maintaining the productivity of each individual.

What does this specifically mean for the realm of qualification in Germany?

The fact that lifelong learning could be an answer to the demographic challenge is hardly a new insight (see Autorengruppe Bildungsberichterstattung 2012 and 2011). Nevertheless, we would like to present in detail several points that could form the basis for reforms that promote lifelong learning:

(1) Early childhood support

Nobel Prize winner James Heckman has shown in many research papers that early childhood educational support makes economic sense (see Heckman et al. 2010). This has far-reaching implications for the design of day care centers and kindergartens.

(2) Schooling: While Germany has significantly improved its PISA ranking over the past ten years (see Klieme et al. 2010), talent is still being squandered due to a process that prematurely selects students into different educational tracks, sending them to schools of varying quality. Social segregation is a tragic reality for the individual and a waste of valuable resources for society. It contributes to the relatively high rate of school dropout (see OECD 2011a, Wössmann 2007). It also has been shown that standardized tests such as PISA fail to reflect the importance of soft skills for vocational success (see Heckman/Kautz 2012).

(3) Vocational training: Germany's dual educational system, under which apprenticeship at a company and vocational education at a school are combined into one course of study, is very highly regarded internationally, and it accounts in part for the low unemployment rate among the country's youths. Currently there are already fewer applicants than training positions in a growing number of regions in Germany. However, the requirements expected from applicants are so high that, according to data from the Bertelsmann Foundation (2011), about 300,000 young people are enrolled in continuing education programs through transitional systems (for example, introductory training schemes). There is a need for alternative ways to earn vocational certificates (for example, modular second-chance programs) as well as for low-level training programs (for example, partial qualification). In addition, there remains too much emphasis on earned qualifications, and too little emphasis on actual skills. Systems to evaluate competency that value both hard and soft skills are still in their infancy (see OECD 2011b).

(4) University education: A growing proportion of each age cohort is entering the university education system. Many have complained about the lower educational

standards that have ostensibly resulted from the fairly recent introduction of Bachelor and Master degree programs in Germany. Clearly, Germany's relatively short 3-year Bachelor degree programs can only serve as a solid basis for entry to the working world if accompanied by lifelong further training. Thanks to technological innovations, virtual universities are beginning to offer new opportunities – not only for vocational training but also further training.

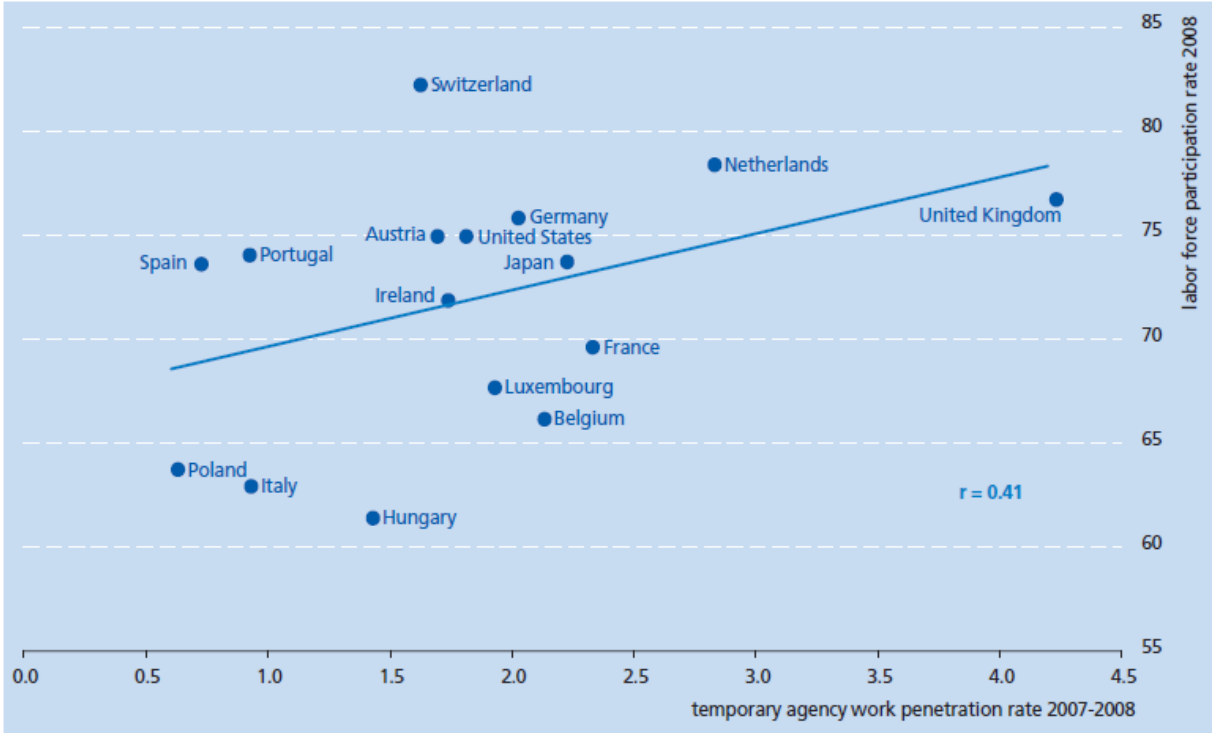
- (5) Further training: Willingness to participate in further training decreases as people get older, and the institutions that provide further training are still set up with an anachronistic view of the further training process as one limited to seminars and evening courses. Modern technologies are going to create major changes in the further training market and in further training institutions – and make them more appealing. It should become a matter of course to pursue continuing education during all of the five decades following graduation from vocational or university training.

Innovation is only possible with highly skilled individuals, and innovation is the fundamental driver of sustained growth in a national economy (see Aghion and Howitt 2009, Acemoglu 2009). Qualification in the sense of lifelong learning and fostering the willingness to innovate are thus the two most important and most sustainable ways of solving the demography trap.

Excursus: The contribution made by temporary agency work

Temporary agency work is closely interconnected with demography when we consider the shortage of skilled labor as a harbinger of the demography trap. Temporary agency work may contribute to solving the shortage of skilled labor by helping to increase the labor force participation rate. Schmid (2010) shows at a minimum that there is a correlation between temporary agency work and a higher labor force participation rate – but he does not present an explicit causal analysis (see Figure 7).

Figure 7: Penetration rate of temporary agency work and labor force participation rate in selected nations, 2007–08



Source: Schmid (2010), p. 130.

In specific terms, particularly older individuals, immigrants and women have been able to enter the work force through temporary agency work. There is descriptive evidence to support this conclusion for Germany.

The example of older workers

Many firms are still reluctant to employ older workers. This attitude is primarily based on stereotypical ideas suggesting that older workers are more often sick, inflexible, and too expensive. Of course, by now larger firms in particular have shifted to designing jobs in an age-appropriate way and providing specialized health programs for their older employees. Nevertheless, there are still obstacles that need to be overcome in practice. Unemployed older workers have an especially difficult time gaining re-entry into the labor market (see Dietz/Walwei 2011).

Experience has shown that temporary agency work can contribute significantly to integrating older workers. According to data from the Federal Employment Agency (2012a), the proportion of employees over 50 years of age in the temporary agency work sector rose

from 10 percent in 2000 to 17.6 percent in 2011. At Randstad, this proportion is actually a bit greater, at 18 percent (see Randstad 2012a).

Older workers can also make use of temporary agency work to pursue employment with firms that may have rejected their individual job applications. This is because firms are willing to hire older workers as temporary agency workers whom they would not have hired directly. The company assumes a relatively smaller risk than in direct hiring, since the temporary work agency is responsible for actually employing the older workers, whom they then assign to the user company for the required time period. The user company only pays for actual work performed. Thus, absences related to illness along with costs for vacations are borne solely by the temporary work agency.

The example of immigrants

In 2010 there were over 15.7 million persons with an immigrant background living in Germany – nearly 20 percent of the total population. Compared to non-migrants, immigrants tend to have less educational attainment. Accordingly, the unemployment rate is about twice as high for immigrants as for non-immigrants (see Federal Statistical Office 2011).

Temporary agency work provides an opportunity for immigrants to find a job. In fact, two thirds of temporary agency workers were previously unemployed or not working (see Federal Employment Agency 2012b, p. 19). There are no specific statistics available for the temporary agency work sector. However, an internal Randstad survey shows that in 2011, about 22 percent of temporary agency workers had an immigrant background (see Randstad 2012b).

The example of women

The typical temporary agency worker is young, unskilled and male (see Spermann 2011, 2012). However, the proportion of women among temporary workers has been gradually increasing – from 23% in 2001 to 28% in 2011. Women are often engaged in service-sector jobs. There has been an observable shift toward part-time jobs – from 5% in 2006 to 9% in 2011. This change reflects the increasing significance of service-sector employment and of women working part-time in temporary agency work (see Federal Employment Agency 2012b). Temporary agency work makes it possible for these women, many of whom were not previously employed, to enter or re-enter the labor market.

Example of qualification

Temporary work agencies bridge the gap between labor demand by firms and the labor supply. If this “match” is successful, then vacancies are filled more rapidly, and as a result, there is a decline in frictional unemployment. Matching is the key service provided by temporary work agencies. Temporary work agencies not only make matches according to qualifications (see Berkhout et al. 2012) but also in terms of hard and soft skills (see OECD 2011a, b). Only if the requirements of the firms are compatible with the skills of the assigned temporary agency workers does temporary agency work fulfill its task.

With the increasing shortage of skilled labor due to demographic change, the matching process will become more difficult (see Schwaab 2009). However, efforts to qualifying applicants and employees in coordination with educational providers, user companies and public authorities may turn out to be a successful response to this challenge. In recent years, all the large temporary work agencies in Germany have started to pay more attention to qualifying temporary agency workers (see Spermann 2009, 2012).

4 The German government's 2012 demography strategy

4.1 Overview

On 25 April 2012 the German government presented for the first time what it called a "demography strategy" (see Federal Ministry of the Interior 2012), which is based on the federal government's demography reports (see Federal Ministry of the Interior 2011).

The demography strategy, titled *Jedes Alter zählt* (Every Age Counts) aims "to open up opportunities to each individual according to his/her life situation and age, to develop his/her potentials and skills, and to realize his/her life expectations" (Federal Ministry of the Interior 2012, p. 1). Further on, the strategy states: "In order to achieve this goal, the federal government will seek to foster conditions in every area of life – from the family to education, from working life and voluntary service to health care – in such a way as to meet the challenges resulting from demographic change" (Federal Ministry of the Interior 2012, p. 1 and 2). Specifically, this means: "The focus of our efforts will be on those areas of life where people will experience the effects of demographic change most directly and most intensively: the family, working life and old age, and in the specific contexts of their rural or urban environment" (Federal Ministry of the Interior 2012, p. 2).

Accordingly, the demographic strategy has the following points of emphasis:

- A. Strengthen the family unit
- B. Promote a motivated, qualified and healthy working life
- C. Promote independent living in old age
- D. Assure the quality of life in rural areas and pursue an integrative urban policy
- E. Assure the foundations for sustainable growth and prosperity
- F. Maintain the government's capacity to act

Under each of these points of emphasis the strategy lists various specific interventions. The issue of labor productivity is mentioned as one point among many in Chapter E: "Increasing labor productivity will not be possible without a broad foundation of qualified workers and firms" (Federal Ministry of the Interior 2012, p. 49). The strategy also states: "The educational level of the population is of critical importance for a nation's economic productivity and innovative strength" (Federal Ministry of the Interior 2012, p. 50). However, the demography strategy only partially acknowledges the idea that increased productivity is the central element in a solution.

4.2 Critique

Clearly there is a widespread conceptual problem regarding the subject of demographic change. Even on the part of many supporters of the government's demography strategy, it is difficult to recognize any clear superordinate goal that organizes their thinking. As presented by the federal government, the demography strategy is more of a hodge-podge of isolated measures than a coherent strategy, a problem that was critically noted by the Confederation of German Employer Associations (Bundesvereinigung der Deutschen Arbeitgeberverbände) (see BDA 2012).

Why is the fundamental insight that increasing productivity will solve our core problem not yet a guiding element of our economic policy?

The short answer: This recognition involves a paradigm shift – and as is well known, paradigm shifts take a while, as illustrated by the transformation in thinking previously witnessed in the German labor market. It took Germany about 15 years to implement this paradigm shift. In the middle of the 1980s, the predominant notion was still that work was scarce and thus needed to be divided among many. Given this perspective, people advocated for a shorter working week (the 35 hour week), the elderly were encouraged to retire early (pre-retirement, partial retirement) in order not to take scarce jobs away from young people, women were expected to work at home, and immigrants were undesirable. Nevertheless, unemployment rose to a higher level after each economic crisis. It was inconceivable that unemployment might actually fall if older people, women and immigrants worked more. However, this turned out to be precisely the way out of the crisis – and the Scandinavian countries provided the empirical proof for this fact. Ultimately, the labor market is not a fixed labor pie that has to be divided (i.e. the "lump of labor" fallacy). This fundamental insight about labor market economics was first put into practice in 2000 through the European Union's Lisbon strategy.

The good news: when Germany undergoes a paradigm shift, change tends to happen quickly. The ambitious goals of the Lisbon Strategy of greater labor market participation for older persons and women were achieved ahead of schedule, as is documented graphically in Figures A1, A2, and A3 in the appendix.

5 Summary and Outlook

Policy-makers are now aware of the most important harbinger of demographic change – that is, the shortage of skilled labor. The solutions proposed by a broad consensus of academic experts have also achieved wide-ranging acceptance: we can postpone and soften the impact of the skilled labor shortage problem by means of increased employment rates for older persons, women and qualified immigrants. Temporary agency work, among other means, can contribute to solving the skilled labor shortage.

This paper has argued that the key challenge associated with demographic change is to increase productivity. By 2040, the work of every 100 individuals active in the labor force will have to finance 62 elderly persons, whereas today, 100 workers only have to financially support 34 elderly persons. This means that all economic policies must be evaluated according to whether or not they increase productivity. This must be the guideline for demography policy, with the aim of preventing a decline in GDP – a key indicator of national prosperity.

Have politicians come to recognize that this is the central economic challenge of demographic change? Unfortunately, only in part. A critical appraisal of the federal government's 2012 demography strategy must conclude that policy-makers still lack clear guidelines.

In the medium term, the two most important and most sustainable ways out of the demography trap are improving qualification through lifelong learning and increasing the private sector's willingness to innovate. In this connection, qualification is a central driver of increased productivity through innovation. Naturally, one cannot imagine an innovative, sustainably growing national economy without a qualified workforce. This has been apparent for many years, and has understandably been an element of numerous national and international reform agendas for Germany.

Yet existing reform agendas frequently fail to consider the complex institutional details of the German system of education and further training. This is part of the reason that reforms do not make much progress. The analogy to labor market reforms is obvious. Only when the reform proposals take the details of the labor market into consideration can they lead to concrete legislation and be translated into real-world practice.

As argued in this paper, qualification is the key task that lies ahead. Institutions that provide education and continuing education have to be reoriented toward an economy that maintains growth through innovation. For this purpose, comprehensive assessments of existing

institutions of higher education and continuing education must be undertaken. Similarly, when the Germany labor market was being reformed some years ago during the Hartz reforms, policy-makers were able to make good use of analyses that had assessed the effectiveness of various labor market policy measures (see Hagen/Spermann 2004).

Yet the transition from the status quo to modernized institutions of higher education and continuing education for lifelong learning is path full of hurdles. If the hurdles are mastered successfully, Germany will overcome the demographic challenge without losing prosperity. The benchmark is the Agenda 2010 for the labor market. These reforms have contributed to Germany's outstanding position in the labor market in comparison to other nations. What is lacking today is the inclusion in the federal government's demography strategy of an equivalent reform agenda for the institutions of education and further training, an agenda that places a core focus on lifelong learning.

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Table A1: Overview of studies of the workforce and skilled labor shortage

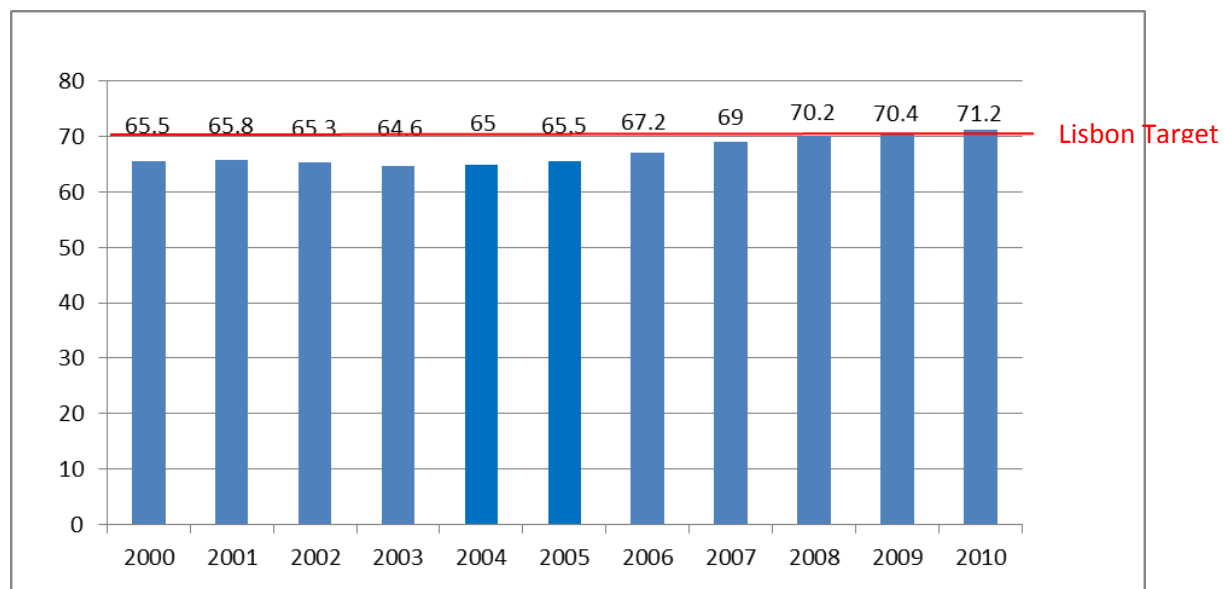
Study	Scale	Solutions and Areas of Action				
		Increasing employment			Increasing productivity	Flexibilization of the labor market
		Working hours	Labor participation	Immigration		
Prognos AG: "Labor Landscape 2030"	2030: Labor gap of von 5.5 to 7 million persons	Extending weekly working hours	Increasing participation of women and older persons	Immigration of skilled workers	Increasing participation in education	More flexible occupational orientation
Federal Employment Agency: "Perspective 2025"	2050: LFP falls to 27 million	Extending working hours for full-time employees	Increasing participation of women, those over 55 years of age and part-time employees and reducing school dropouts and dropouts from higher education and training	Immigration of skilled workers	Promoting training and qualification as well as increasing labor market transparency (better matching)	Controlling taxes and fees
Berkhout/van Berg: "Bridging the Gap"	2050: Labor gap in the EU-27 states of 15% (to 19%) or 35 (to 37) million persons		Increasing the labor market participation rate	Promoting migration	Increasing real productivity per worker	The "Flexicurity" model (flexible employment plus income security)
Bertelsmann Stiftung: "Societal Aging "		Extending working life	Increasing the labor market participation rate	Increasing immigration	Increasing education and continuing education	

German Council of Economic Experts: "Challenges of demographic change"	2060: Decline of the LFP in Germany from 43 million to 31 million	Prolonging the work-week	Increasing the labor market participation rate	Increasing immigration of qualified workers	Increasing education and continuing education	Flexible working hours models
IW Study	2060: Decline of the LFP in Germany from 50 million (2008) to 34-38 million	Increasing annual working hours and working life	Increasing the birth rate and labor market participation rate	Increasing immigration by qualified workers	Reducing educational poverty, making higher qualification easier, improving labor market access for migrants, enabling lifelong learning, increasing innovation strength	
ZEW Study	2025: 2.5 million fewer persons than in the 2014 reference scenario	Prolonging the work-week	Increasing the labor market participation rate for older persons and women to the level in Sweden	Increasing immigration by qualified workers		

Sources:

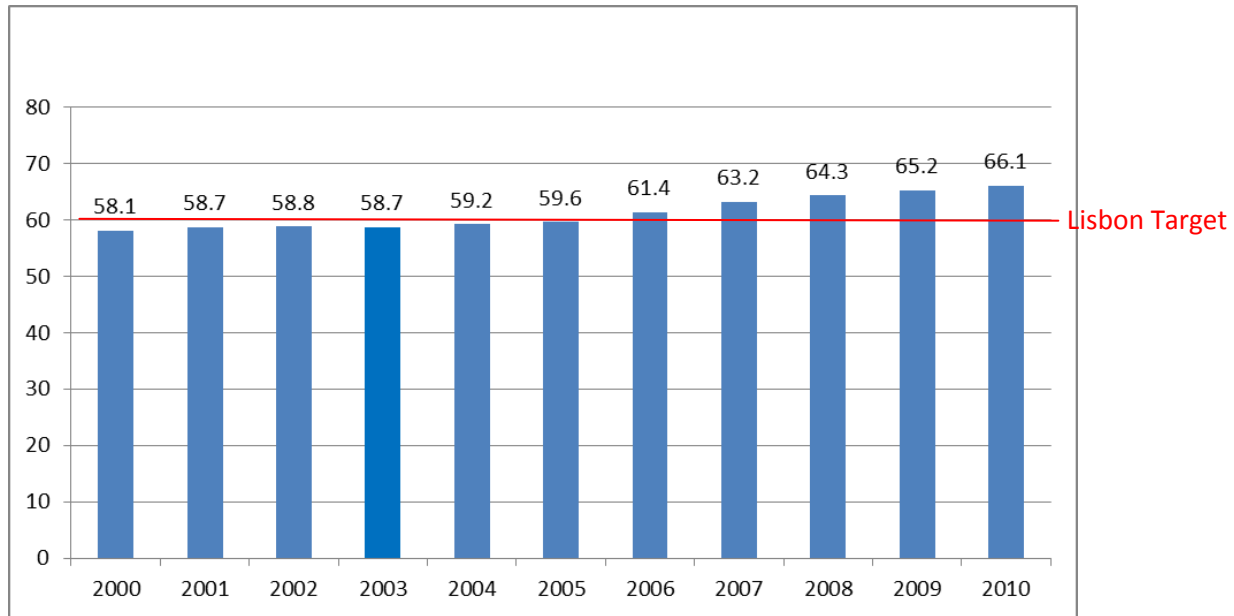
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Figure A1: Labor force participation rate in Germany (2000–10)



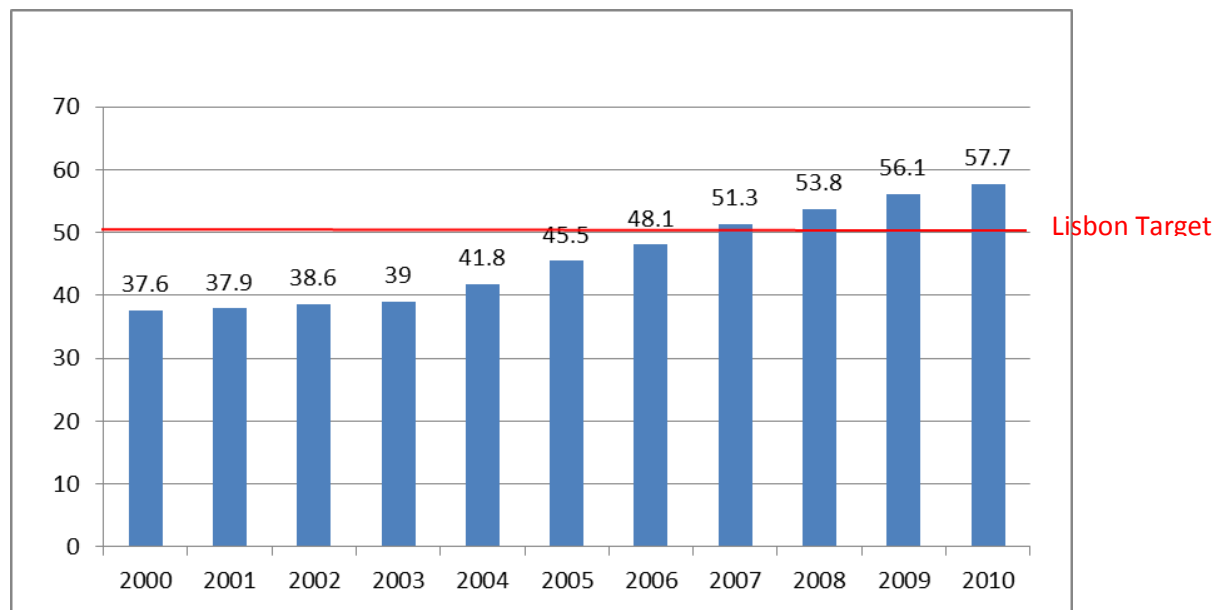
Source: OECD Employment and Labour Market Statistics (Employment/Population ratio)

Figure A2: Labor force participation rate of women in Germany (2000–10)



Source: OECD Employment and Labour Market Statistics (Employment/Population ratio)

Figure A3: Labor force participation rate for older persons (55–64 years of age) in Germany (2000–10)



Source: OECD Employment and Labour Market Statistics (Employment/population ratio)