Special Analysis

Why did the unemployment rate keep on falling in Germany after 2007?

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Today, Germany has apparently achieved almost full employment, with a jobless rate of around 5%. And yet just before the 2008 crisis this rate, just as in France, stood at over 7%. Why has unemployment continued to decline since that time, when in all the other advanced economies it is increasing?

There are five possible explanations for this good performance that are often put forward: unemployment has decreased in Germany because the working-age population is decreasing; because growth is higher, especially thanks to better export competitiveness; because short-time working increased considerably during the crisis; because wages have risen much less than productivity since the second half of the 1990s, and finally, because the labour market has changed profoundly as a result of the Hartz reforms, implemented between 2003 and 2005. In fact, the respective contributions of these five factors to the steady reduction in unemployment are very uneven.

First of all, since 2005, Germany's active population has grown more rapidly than at the beginning of the 2000s, and almost as much as in France, despite a drop in the working-age population: the economic labour force participation rate has seen a distinct rise, mainly among older people. The fall in unemployment is therefore not Malthusian in origin, even though it is true that the active population of young people and adults has decreased since 2005, which could have influenced recruitment behaviour in some sectors. Thus the fall in unemployment is the result of very dynamic job creation factors, which have persisted since 2009.

The fall in unemployment cannot be explained simply by higher growth in economic activity in Germany. German growth has indeed been higher than growth in France for the last eight years (+1.4% compared with +0.8% on average), but this rate is barely higher than the country's average at the beginning of the 2000s, a period when the unemployment rate was rising. Moreover, the volume of work in Germany today is very much higher than what was forecast by econometric modelling as a function of economic activity.

Finally, short-time working has certainly increased considerably during the crisis, peaking at 1.5 million workers affected in 2009, or the equivalent of 3% of the active population. However, in 2012, short-time working returned to its pre-crisis level; this may explain why unemployment did not increase much in 2009, however it does not explain why the rate has since moved downwards.

Why did the unemployment rate keep on falling in Germany after 2007?

It would appear that the drop in German unemployment is structural. This is what the evolution in real wages would tend to indicate: since 2005, they have risen by only 2%, while the unemployment rate has been halved. In addition, the job vacancy rate is currently at the same level as at the beginning of the 2000s, when the jobless rate was at 8%.

This fall in the structural unemployment rate appears to have happened mainly before 2005, through wage restraint (from 1996 to 2005, unit wage costs decreased by 2.3%) and the Hartz reforms (especially those applied to providing support and benefits for the jobless). The effective unemployment rate only started to fall when external demand took over from the stagnating domestic demand.

Since 2009, effective unemployment has continued to fall, through a reduction in productivity gains. There are several possible reasons for this reduction: reintegration of less productive employees into work; labour retention, given that labour force will become more scarce in the years to come; in a context that is particularly uncertain for business prospects, companies prefer employment, which can be adjusted more flexibly than capital. In all these instances, this drop in productivity gains has been helped because companies are in good financial health, and more especially because of the moderate cost of capital. The absence of any tensions, either in wages or in vacant jobs, seems to suggest that the effective unemployment rate is now close to its structural level.

This performance on the employment front nevertheless has its downside. It has been achieved in part by the creation of part-time or very part-time jobs, and this has led to increased wage inequalities. In addition, the tightening of conditions for receiving benefits, combined still with a very high proportion of long-term unemployed, has led to a large increase in the poverty rate among the jobless. ■

Why did the unemployment rate keep on falling in Germany after 2007?

Fact: a very large drop in unemployment in Germany since 2005

A large drop in the unemployment rate in Germany since 2005...

The unemployment rate has dropped considerably in Germany since 2005 *(see Box 1[1])*: it stood at 11.4% in Q1 2005, but reached 5.4% in Q4 2012 *(see Graph 1)*. Conversely, in France and, even more so in the Eurozone, the unemployment rate was higher at the end of 2012 than it had been in 2005.

... which was almost uninterrupted in 2008-2009

It is striking that the 2008-2009 crisis reversed this drop in the unemployment rate in Germany only temporarily. It did indeed increase moderately between Q4 2008 and Q3 2009, but then it decreased considerably once again.

A drop that benefited all categories of age and gender

Overall, the drop in unemployment in Germany since 2005 has benefited both men and women and all age groups *(see Graph 2)*. In contrast, the increase at the beginning of the 2000s was much greater among young people, and spared the older age brackets. Today, the unemployment rate for 15-24 year-olds is markedly higher than the rate for the older age bracket, and the rate for 55-64 year-olds has virtually returned to average levels.

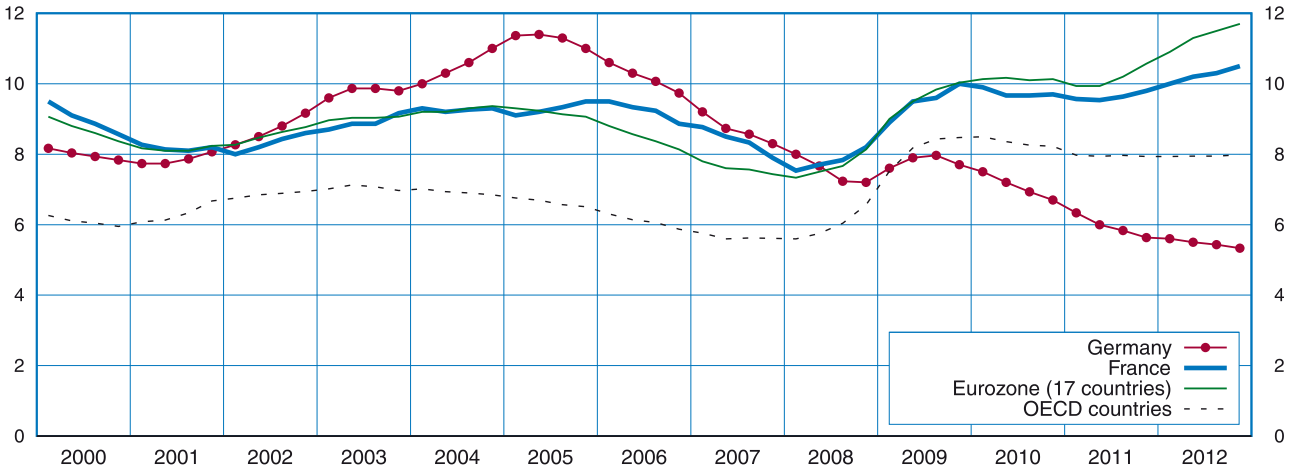
The proportion of long-term unemployed has also fallen *(see Graph 3)*, but less so. This proportion currently stands at about 50%, a particularly high level not only in absolute terms, but especially so for a country with almost full employment. For comparison purposes, in 2006 this proportion was 10% in the United States and 22% in the United Kingdom, when these two countries had full employment. Today, the proportion of long-term unemployed in OECD countries is about one third. This overweighting of the long-term unemployed in Germany can be seen across all age groups.

What is the reason for this drop in the unemployment rate?

Why is the unemployment rate in Germany lower in 2012 than in 2007, just before the crisis? There are several explanations that are often put forward. It is suggested that unemployment fell in Germany because the active population decreased, because growth was higher, especially as a result of better external competitiveness, because short-time working increased considerably during the crisis, and finally, because the functioning of the labour market was more

(1) Box 1 describes the different ways of measuring unemployment and the data used in this document

1 - Harmonised unemployment rate since 2000

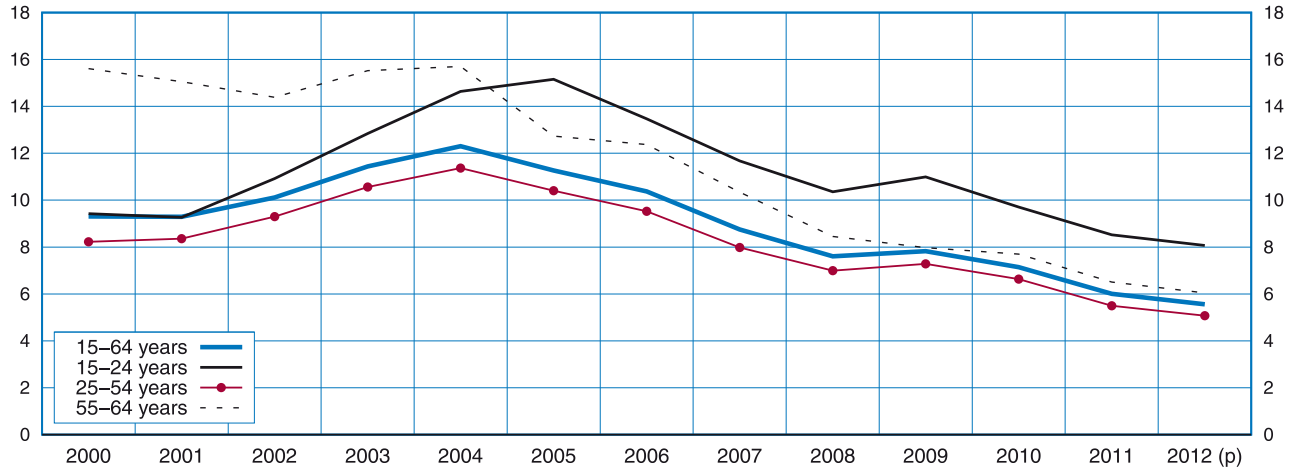


Scope: Percentage of active population from 15 to 64 years

Source: OCDE

favourable to employment. The first three of these explanations probably account for only a very small share of Germany's performance in terms of unemployment rates: this is discussed in the second and third parts of this report. In the fourth part, the structural factors of the fall in unemployment rates are analysed in detail, and in particular, the part played by wage restraint and the Hartz reforms *(see Box 2)*.

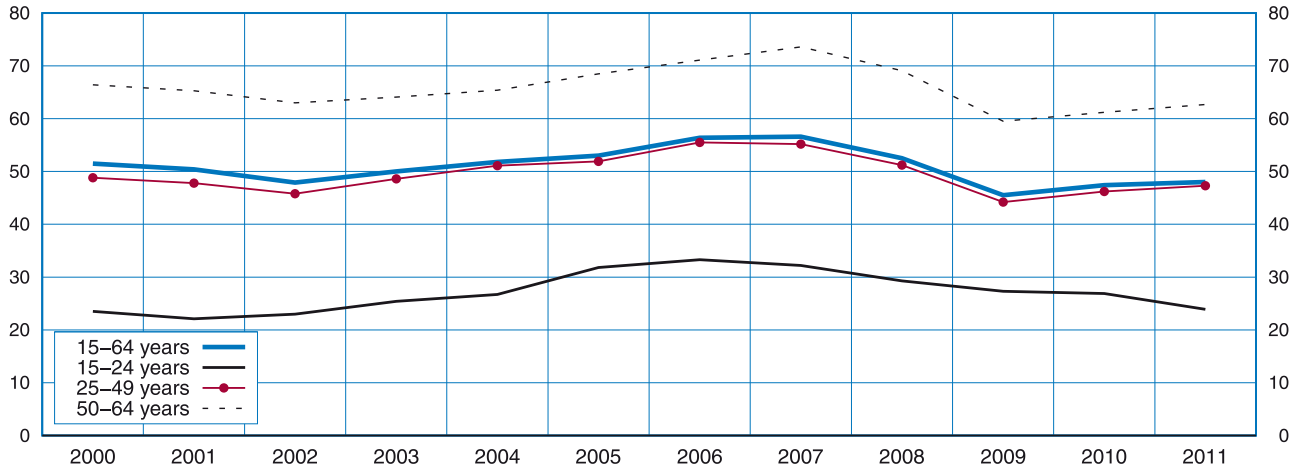
2 - Unemployment rates by age



Scope: German active population from 15 to 64 years

Source: Destatis, Employment Survey

3 - Share of long-term unemployed in total unemployment



Scope: German active population from 15 to 64 years

Source : Destatis, Employment Survey

Box 1: Measuring employment and unemployment: available data

There are several unemployment rate measurements available for Germany. The first, called «unemployment rate as national concept», is based on the number of job seekers working less than fifteen hours per week and who are registered with the National Employment Agency (Bundesagentur für Arbeit). In December 2012, this unemployment rate stood at 6.8%. A second measurement is the «ILO» method, according to the standardised definition by the International Labour Office: this is the one used in this document, as international comparisons are easier to make. As in France, two measurements are used by the Federal Statistics Office Destatis to calculate employment:

- The first is based, like the ILO unemployment rate, on the German equivalent of the French employment survey, (Labour Force Survey, LFS, or Employment survey).
- The second is calculated in the fraework of national accounting from over 50 different sources, including employee contributions and data from the Federal Employment Agency.

These series of employment data differ substantially: in 2012, there were 40.0 million people in work according to the LFS, and 41.6 according to the national accounting, the difference between the two being 1.6 million. This gap has been reduced in recent years: in 2005 it was 2.3 million.

The first two parts of this report focus on the LFS data, the only data from which labour force participation rates can be calculated by age and by gender. The section on employment, on the other hand, uses data from national accounting, firstly because the series are broken down by branch, and secondly because they are more appropriate for analysing productivity, since they are created in conjunction with production data. ■

Box 2: Labour market reforms in Germany

The German labour market has experienced some major reforms which profoundly modified the way it functions from 2003 onwards. During the 2008 crisis, a certain number of exceptional measures were implemented.

1. Reforms started before 2008

Reforms to the labour market in Germany have been many and varied. They started in 2003 in Chancellor Gerhard Schröder's government. Commissioned by the government, Peter Hartz, who was at that time a member of the board of the carmaker Volkswagen, submitted a report which gave rise to a series of reforms of active labour market policies. These measures are described in detail in the report by the Commission of economic analysis (Kramarz et al., 2012) and are presented here briefly.

These reforms had three different goals. The first was to make better matches between job offers and applications. The second concerns activating jobseekers according to the principle of "providing support and making demands" (Fördern and Fordern). The third was to increase the demand for labour by reducing labour costs (Jacobi and Kluve, 2007).

Hartz I

Relaxing the anti-redundancy regulations, tightening conditions of access to the unemployment benefit system, support for vocational further education and strengthening temporary employment were the main measures of this first labour market reform. This first part came into force on 1st January 2003.

Hartz II

On 1st April 2003, the second wave of Hartz reforms came into force. One of the most important measures was the creation of a single "gateway" for the unemployed, the job-center, through cooperation between the Federal Employment Agency and the social funds. Enterprise creation procedures were relaxed, especially for the unemployed.[1] The simplification of the administrative procedures for certain insecure jobs also formed part of these Hartz II reforms. Mini-jobs and midi-jobs were created.

Mini-jobs are poorly paid, exempt from social contributions and taxes for the employee, but taxed at 27% for the employer. The exemptions from social contributions resulted in reduced social entitlements for the employees (which is not the case France). The vast majority (96%) are limited to 400 Euros per month.[2] The other jobs called midi-job can exceed this monthly ceiling, but must last less than two consecutive months if they are for 5 days a week, or if not, less than 50 days in one year. This represented 222,000 student jobs or extra jobs for 57,000 people in 2011.[3]

In practice, mini-jobs already existed before 2003, but these were only jobs that consisted of less than 15 hours per week and which were paid less than 325 Euros per month (and on condition that they were a main job). Midi-jobs are jobs that are paid between 401 and 800 Euros per month, with a decreasing scale of exemption from social contributions with the salary level. They provide a solution for continuity between mini-jobs and standard jobs.

Hartz III

The National Employment Agency and the federal employment agencies were restructured in the third part of the Hartz reforms (1st January 2004).

(1) This measure was suspended recently because it was too costly.
(2) Since 1st January 2013, they are limited to 450 Euros per month.
(3) These jobs should not be carried out «professionally».

Why did the unemployment rate keep on falling in Germany after 2007?

Hartz IV

Social benefits, especially for the unemployed, were modified extensively with the Hartz IV reform, which came into force on 1st January 2005.

First, unemployment insurance was tightened, not only in terms of the eligibility criteria (people now had to have contributed for twelve months in the last two years, compared with three years previously) but also for the maximum duration of payments (reduced from 32 to 18 months for older people aged over 55 and from 26 to 12 months for the others). Also, anyone unemployed for more than twelve months now fell under the Arbeitlosengeld II (or Alge II) regime and was obliged to accept a job (concept of zumutbar or «any job is acceptable»), even if it did not correspond to the person's qualifications or if it was located far from his home.

In addition, payments were no longer proportional to previous wages, but instead were a flat-rate benefit, calculated according to need, and subjected to means testing using a «criterion of need», the Bedürftigkeit. Thus if a person's means and assets (property or goods) were above a certain threshold then aid was cut. Jobseekers could however combine this allowance with income from work, within certain limits. The Hartz IV reform notably created assisted contracts, where the employer paid between one and two Euros per hour (ein-euro-Job), for a few hours of work a week and this income could be cumulated with the unemployment benefit. The ein-euro-job replaced a similar measure, Hilfe zur arbeit, which before 2005 was managed by the municipalities. The increase in employment as a result of the ein-euro-jobs was, at the most, 200,000 jobs more than in 2004 (Hohmeyer and Wolff, 2006) and mainly in the non-market sector. In his assessment of the measure, Hohmeyer (2009) concluded that the programme was rather ineffective with regard to jobseeker employability, and that it even had a lock-in effect for anyone who stayed in this type of job for any length of time.

Pension reforms

Alongside the Hartz reforms, Germany also put in place major reforms of the pension system. In particular, these announced the end of early retirement and a gradual increase in the full rate retirement age from 60 to 67.

2. Measures implemented during the 2008 crisis

Short-time working

The aim of this measure was to retain the potential of qualified labour while at the same time not penalising businesses during the crisis. Avoiding redundancies and getting quickly back to work if necessary are two key issues in short-time working. The percentage of employees affected by short-time working (Kurzarbeit) increased from less than 0.5% in 2007 to more than 3.5% in Q2 2009 before returning to its original level in Q3 2010 (Fréhaut, 2012). In 2009, about 15 million German employees had experienced an episode of Kurzarbeit.

Local employment agreements

Pre-dating crisis coalitions, defensive co-management of the restructuring of export sectors such as manufacturing industries ensured that company competitiveness could be preserved.

During the crisis, more and more of these local agreements were drawn up, often including long-term wage restraint clauses in exchange for job guarantees. These local agreements were for a fixed duration and came with guarantees such as no redundancies for 6 years and the inclusion of apprentices, who were more exposed than other workers to the risk of unemployment (Hege, 2012). They were strictly controlled by the trade unions who could impose financial sanctions on a company that did not respect the guarantees.

Other instruments

Some other instruments were used for internal flexibility. To cope with the decline in activity, «time savings» accounts were closed and overtime was ended. For example, the winding down of time savings accounts accounted for approximately 21% of the reduction in hours worked per capita in 2009 (Ziemann, 2010). ■

Why did the unemployment rate keep on falling in Germany after 2007?

Despite the decline in the total population, the active population has increased almost as much as in France since 2005

The demographics of Germany differ somewhat from those of France since the total population is decreasing. Does this situation favour a «Malthusian» drop in unemployment? The answer would seem to be no. On the one hand, economic theory suggests that demographic changes have at best a transitory effect on the unemployment rate *(see Box 3)*. On the other hand, while the total German population declines, the active population continues to increase *(see Table)*, sustained mainly by policies introduced since the beginning of the 2000s.

The working-age population in Germany is decreasing...

From 2005 to 2012, the working-age population in Germany (15-64 year-olds) fell by almost one million *(see Table)*. This decline, which began at the end of the 1990s, concerns mainly the youngest age brackets (15-24 year-olds and 25-54 year-olds) whereas the 55-64 year-old population continues to increase.

... but the active population is increasing

Despite this drop in the working-age population, the active population, on the other hand, continues to grow: after virtual stability from 2000 to 2004, the German active population increased by 4.0% between 2004 and 2012 while in France it increased by 4.7%. Most of this increase in Germany occurred in three years (2005, 2006 and 2011), whereas it was much more regular in France *(see Graph 4)*. Whatever the case may be, it is difficult to put a share of the drop in unemployment in Germany down to changes in the active population.

The continued rise in the labour force participation rate cannot be accounted for by the composition of the active population

The labour force participation rate has increased substantially in Germany in the last six years: it settled at 77.0% of 15-64 year-olds in 2012 or 3.3 percentage points more than in 2005.This rise may be affected by the ageing of the active population, to the extent that the influence of the youngest age groups, who are also the least active, automatically decreases. To neutralise this effect, a «constant structure labour force participation rate» has to be constructed, a non-weighted mean of labour force participation rates by age, which thus eliminates the demographic effects of relative change in the size of the age groups.

This constant structure labour force participation rate, or apparent labour force participation rate, has increased by 2.8 points since 2005, in other words scarcely less than the labour force participation rate *(see Graph 5)*. Thus the composition of the population accounts to a very small degree for the increase in the labour force participation rate in Germany. It should also be noted that the proportion of 55-64 year-olds in the working-age population is no higher today

Population change between 2005 and 2012 (p)

in thousands

	Men				Women			
	Population				Population			
	Total	Active	Employment	Unemployment	Totale	Active	Employment	Unemployment
15 to 24 years	-384	-197	23	-220	-389	-119	36	-155
25 to 54 years	-446	-523	395	-918	-571	76	812	-736
55 to 64 years	387	849	982	-133	516	1 025	1 121	-96
Total of 15 to 64 years	**-442**	**128**	**1 400**	**-1 272**	**-444**	**982**	**1 968**	**-987**

How to read it: From 2005 to 2012, a further 1.025 million women aged between 55 and 64 participated in the labour market.
(p) : provisional data, authors' calculations

Source: Destatis, Employment Survey

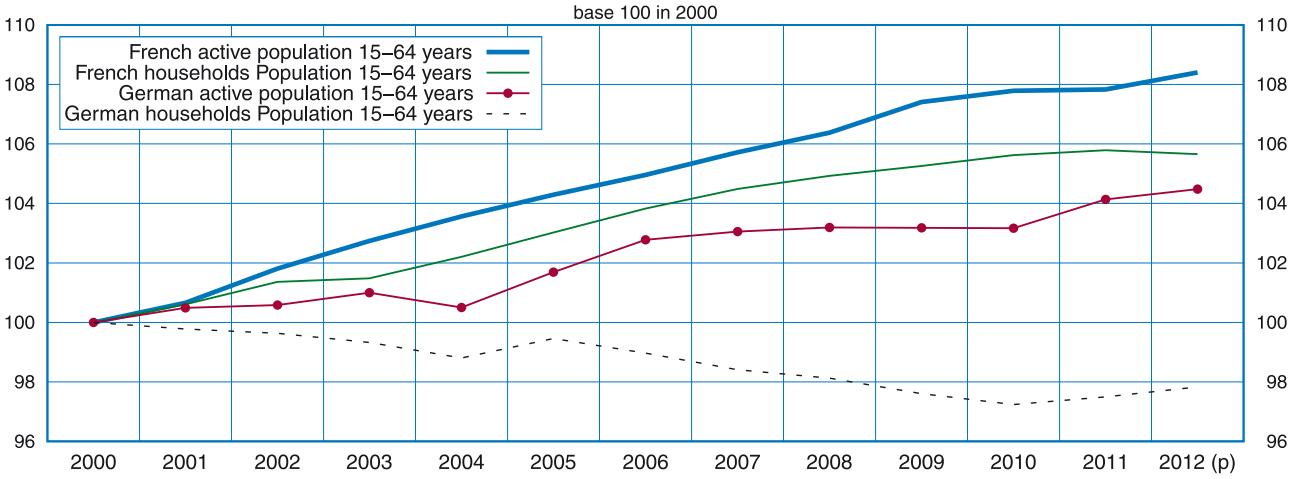
Why did the unemployment rate keep on falling in Germany after 2007?

than it was in 2000. Population ageing has affected Germany since the 1990s, as a result of the first baby-boom in 1935. In symmetry with this, the proportion of 15-24 year-olds in the working age population is no smaller today than it was in 2000. This is because the birth rate rose in the 1980s, before falling in the 1990s.

The labour force participation rate among 55-64 year-olds has increased considerably...

The growth in the labour force participation rate overall in Germany is associated to a large extent with that of the labour force participation rate among 55-64 year-olds *(see Graphs 6 and 7)*. Older people are working longer and longer in Germany and the number of people aged 55 to 64 in employment or unemployed, proportional to the total number of people of the same age, is increasing more and more. Thus in 2012, 1.8 million more older people were active than in 2005, whereas the total active population had increased by only 1.1 million.

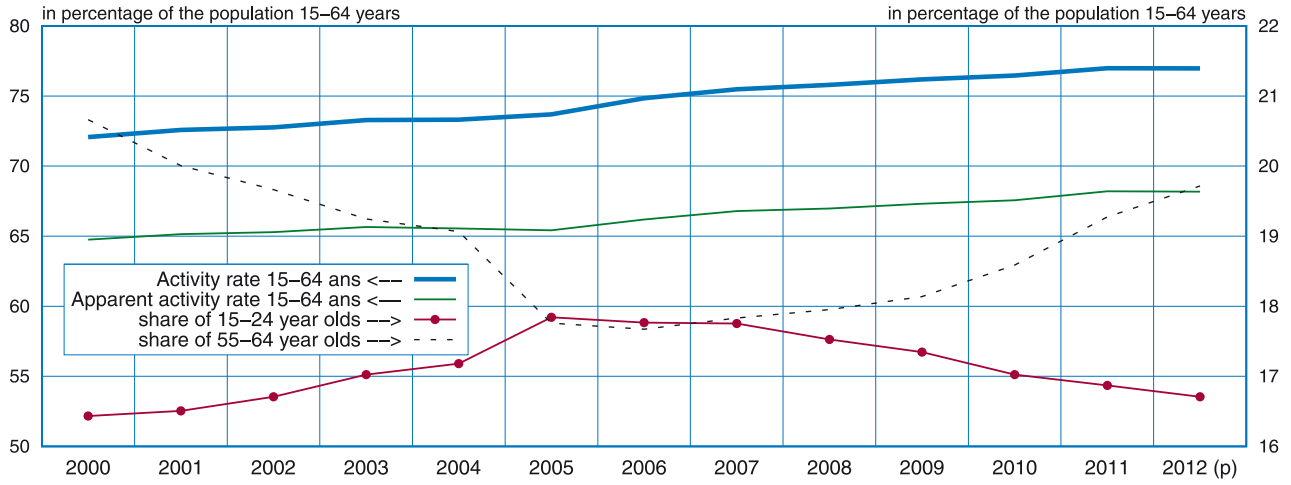
4 - Population and labor force in France and Germany



(p) : provisional data, authors' calculations

Source: Destatis, Employment Survey

5 - Rate and proportion of age groups in the population



How to read it: The proportion of young people in the active population grew from 16% to 18% between 2000 and 2005, before decreasing through to 2012 and settling at 17%.
The apparent labour force participation rate is calculated by dividing the working-age population into 5-year age brackets

(p) : provisional data, authors' calculations.

Source: Destatis, Employment Survey

... and female employment is on the rise globally

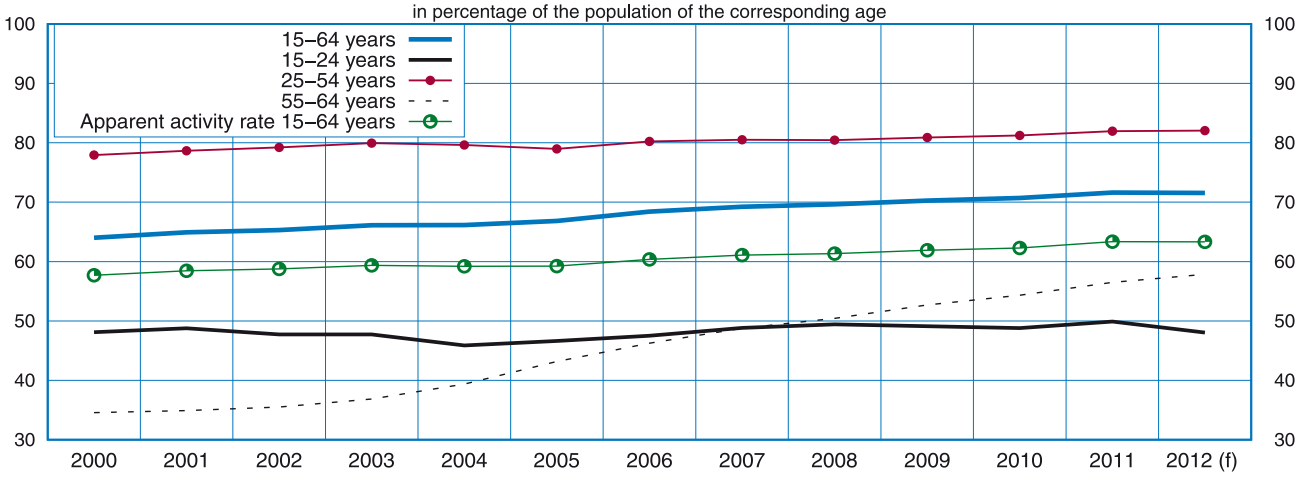
Women's activity has increased more than that of men, due to a catch-up effect *(see Graph 6)*. This increase is particularly marked among women over 55. It is notable among women aged 25 to 54, whereas the labour force participation rate for men in this age bracket has stabilised *(see Graph 7)*. While the number of women of working age decreased by almost half a million between 2005 and 2011, the number of women in activity increased by almost a million.

Government policies have contributed to the growth in labour force participation rates

While the German population has been declining for several years, the active population (in employment or unemployed) continues to increase, due to the growth in the labour force participation rate of older people and women. What are the factors that account for this phenomenon?

The various reforms put in place between 2003 and 2005 *(see Box 2)* have certainly helped to increase the active population. By reducing labour costs for some types of employment, certain measures (Hartz II) have encouraged the creation of jobs that are very part-time. This has probably contributed to the increase in activity among women.

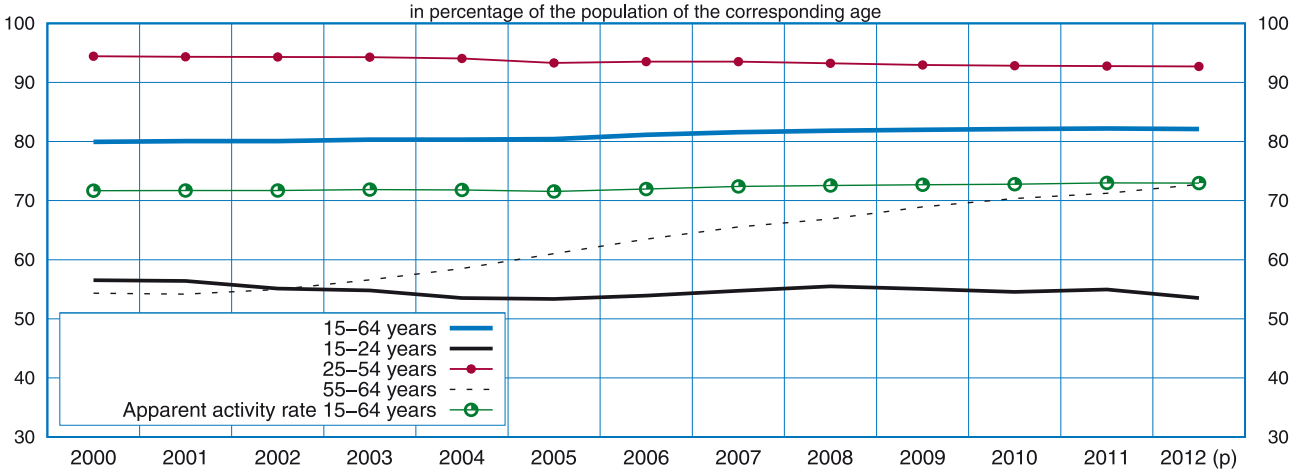
6 - Participation rate of women by age



(p) : provisional data, authors' calculations

Source: Destatis, Employment Survey

7 - Participation rate of men by age



(p) : provisional data, authors' calculations

Source: Destatis, Employment Survey

Why did the unemployment rate keep on falling in Germany after 2007?

The end of early retirement has probably kept older people in activity when they would previously have become inactive. At the same time, the different retirement reforms have pushed back the age at which people draw their pensions. Thus the effective mean age of retirement increased by one year between 2000 and 2010, from 62.5 years old to 63.5 years old. Although difficult to quantify, the reduction in the duration of unemployment insurance (Hartz IV), in particular the shortening of the duration of unemployment insurance benefit for older people from 32 months to a maximum of 18 months, certainly also contributed to increasing the active population.

In addition, the change in unemployment insurance and benefit regimes as a result of the Hartz IV reform *(see Box 2)* increased the number of people considered as capable of working. This change in regime effectively reduced the number of social welfare beneficiaries who are not obliged to work. Anyone with the physical capacity to work three hours per day, is declared capable of working and is then obliged to accept a job, as «all jobs are acceptable» (Bourgeois, 2004).

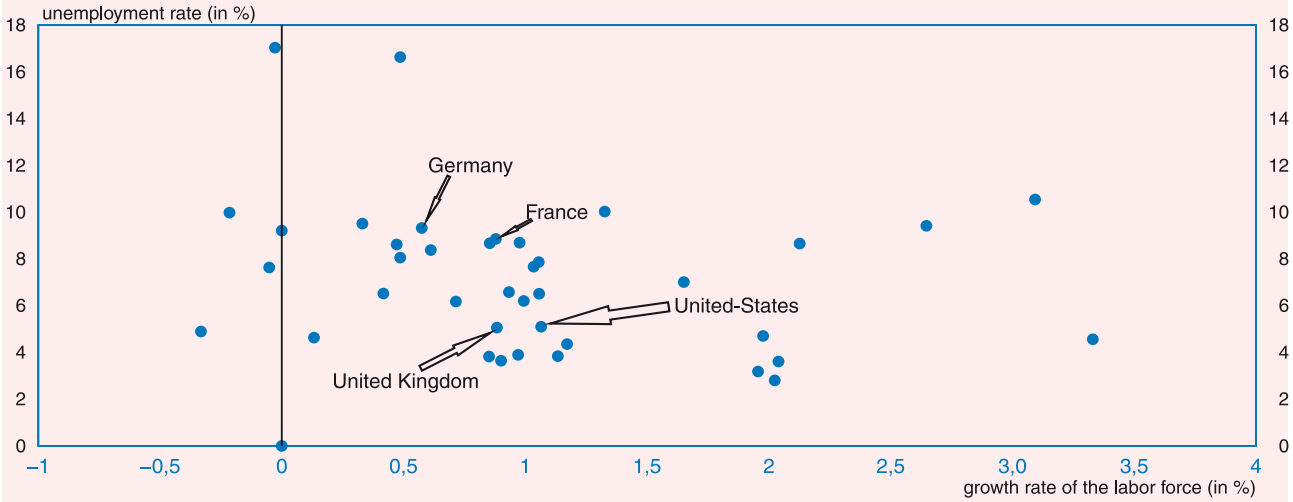
Box 3: Does a drop in the active population automatically lead to a drop in unemployment?

It is commonly believed that a slowdown in the active population, and especially a drop in numbers, are factors that will bring about a drop in unemployment. It would then be easier to "provide jobs for everyone". In fact most analyses, both empirical and theoretical, conclude that it has only a very partial effect, which is in any case only transient.

Strictly speaking, there are no empirical assessments of the impact that a stabilisation of the active population would have on the unemployment rate. A slowdown in the active population is usually spread over a decade or even longer, which makes it difficult to identify its effects. However, there are several well-established facts that can be applied to contradict the idea that in this context unemployment decreases automatically. First of all, there is a large amount of literature on the impact of sudden migration influxes on the unemployment rate. For example, *Card* (1990) analysed the arrival of Cuban refugees in Miami in 1980; *Hunt* (1992) looked into repatriates from Algeria in the 1960s; *Angrist* and *Kugler* (2001) studied the impact of refugees from Kosovo in the 1990s. Each of these studies concluded that a sudden increase in the active population had little impact on unemployment figures. Next, there is absolutely no correlation between active population growth and the unemployment rate in OECD countries *(see Graph)*.

The main theoretical models of the labour market run counter to the Malthusian notion, according to which a demographic slowdown reduces the rate of unemployment. Eventually, this rate is determined by how effectively the labour market is working, or even, according to different models, by underlying productivity gains, the total tax burden as it affects the labour factor and the real cost of capital.

Unemployment rate and growth rate of the labor force 2000-2007



Source: OECD

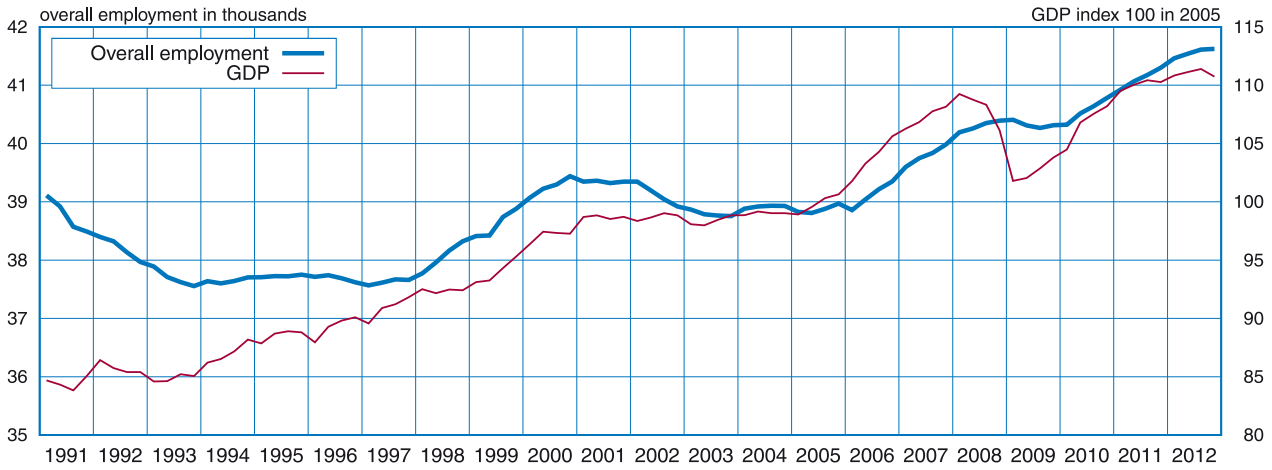
Certainly in the very short term, a reduction in the size of labour market entry cohorts may lead to a reduction in the employment rate. But at best this has only a transient effect. This drop in unemployment in fact leads to an increase in employees' bargaining power, and hence to an increase in the cost of labour. This then reduces the demand for labour, and, all other things being equal, brings the unemployment rate back to its original level. The more quickly the repercussions for wages of a drop in unemployment take effect, the shorter the duration of this transient phase and the smaller the drop in the unemployment rate: *Cahuc* and *Zylberberg* (2001) believe that, after considering the time delays observed in French macroeconomic data, the drop in the unemployment rate following a sudden stabilisation of the active population should fade within 5 years. If this stabilisation occurs gradually, over a ten-year period, then the impact on the unemployment rate seems negligible if wages do indeed react to this drop in unemployment. Nevertheless, if for different reasons, upward pressures do not affect wages, as seems to be the case in Germany, a Malthusian effect on the employment rate could last longer.

In practice, as the working-age population stabilises it usually ages at the same time (even if, as we have seen, this is not the case in Germany since the 2000s). This happens as the size of the exiting cohorts increases and/or the size of the entry cohorts decreases. Independently of the slowdown in the active population, the impact of ageing on the unemployment rate is ambiguous, as theories about its effects are divided (*Domingues Dos Santos*, 2001).

On the one hand, a reduction in the flow of new entrants into the job market means that the efficiency of the process of matching people to jobs can be improved. This process is by definition most difficult for first time entrants. It may also result in an increase in productivity, which may in turn lead to a drop in unemployment if wages are not perfectly indexed.

On the other hand, the ageing of the active population may also increase the unemployment rate, via different channels. Ageing may lead to the cost of labour increasing more rapidly than productivity, if pay is related to length of service (*Aubert* and *Crépon*, 2004). Also, the ageing of the population may have a negative influence on the very efficiency of the matching process, if an older active population is less adaptable to technological and organisational innovation. Finally, if ageing results in an increase in the cost of labour in order to finance, for example, financial requirements linked with the increasing active/inactive imbalance, then this may lead to an increase in unemployment (*Ouvrard, Rathelot* and *Simon*, 2008). ■

8 - Business growth and employment



Source: Destatis, quarterly accounts

Why did the unemployment rate keep on falling in Germany after 2007?

The two faces of job creation: the resilience of activity and the slowdown in productivity since 2008

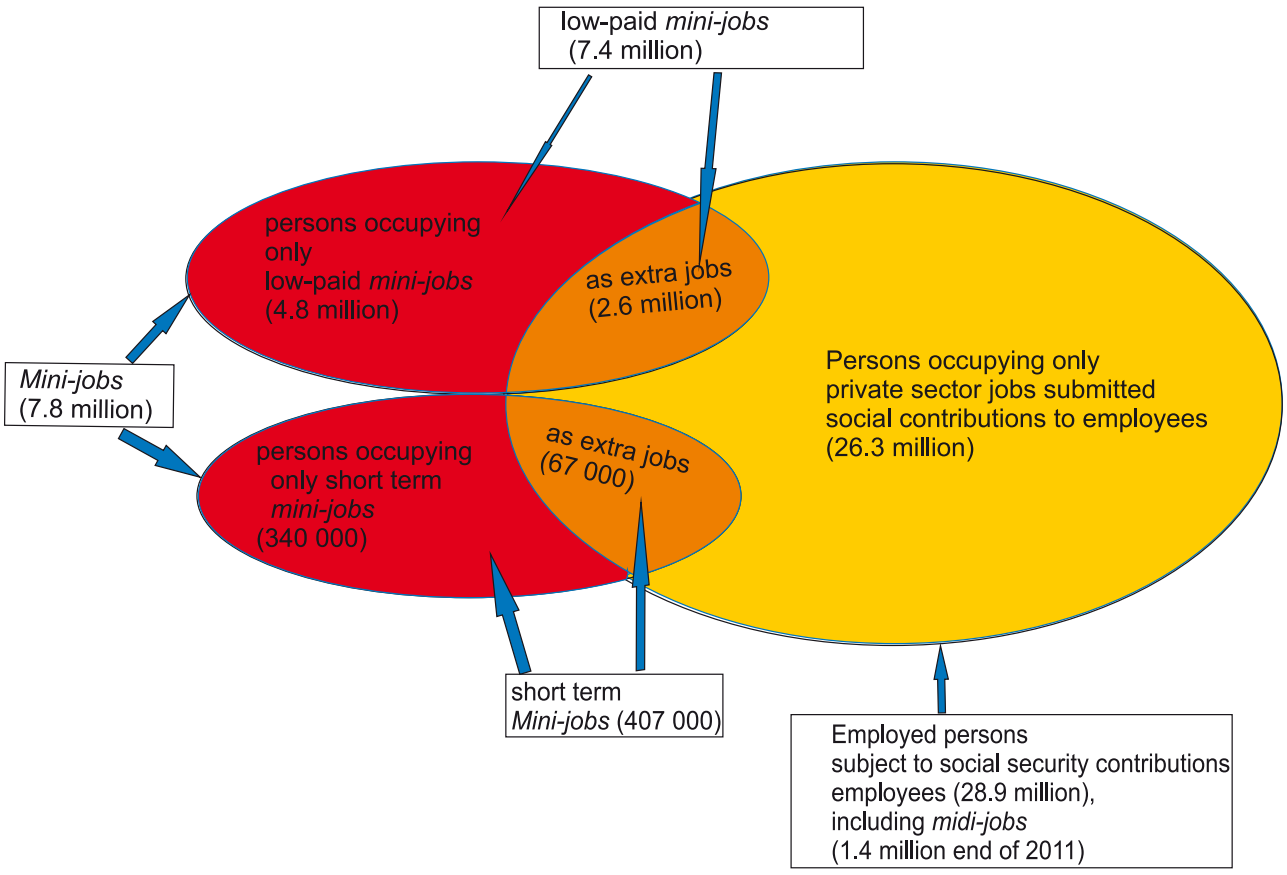
Employment has increased strongly and almost continuously since 2005

The volume of employment in Germany has increased substantially since the beginning of 2005 (2.7 million extra jobs), whereas it had previously stagnated: at the beginning of 2005 it was at the same level as at the beginning of 2000, which was also the same level as in 1991 (see *Chagny* (2008), for an analysis of developments in the labour market in Germany since 1990). Over the last eight years, this increase has been interrupted only in the second and third quarters of 2009. This creation of jobs has been sustained by activity: mean growth has been 1.4% since the beginning of 2005, compared with 0.8% in France. However, while job creations in Germany have been twice as dynamic over this period as in the eight previous years, growth has been identical *(see Graph 8)*. Remarkably, job creation has been much more dynamic than activity would have led one to expect.

The creation of mini- and midi-jobs had an impact especially before 2005

These job creations came about at a time when the functioning of the German labour market was being changed *(see Box 2)* and underwent structural transformations. The number of mini-jobs and midi-jobs currently stands at 7.8 million and 1.4 million respectively *(see Graph 9)*. These jobs therefore represent a substantial proportion of private paid employment (28.1 million).

9 - Distribution of employment by category in 2012



Data on 30 June, 2012
Graph published on Körner et al. , 2013

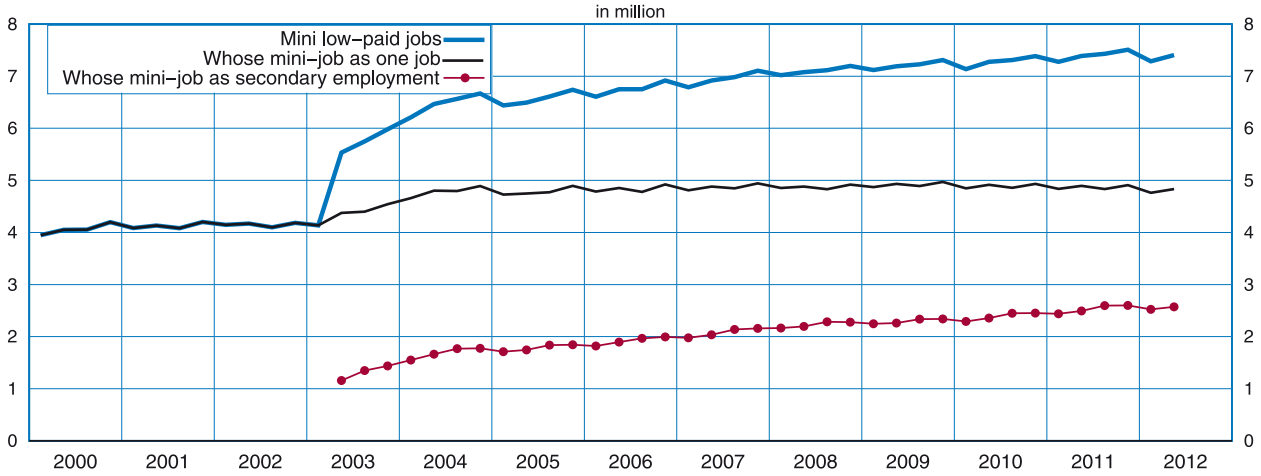
Source: Bundesagentur für Arbeit

Before 2003, there were already 4.4 million mini-jobs, according to data from the German employment agency. The increase in the number of mini-jobs since 2003 has happened in two stages *(see Graph 10)*. In 2003 and 2004, it concerned main jobs as well as secondary jobs. Salaried workers aged 25 to 54 were the most affected *(see Graph 11)*. Since that date, the increase has affected only secondary jobs, and this time it was salaried workers aged 55 to 64 who were the most concerned.

The impact of mini-jobs on the volume of employment was not equivalent to the number of mini-jobs as principal jobs (Eichmorst et al., 2012). In addition, these jobs were able to substitute for standard part-time jobs. The same reasoning could be applied to the midi-jobs. Micro-econometric assessments (Jacobi and Kluve, 2007) have been unable to estimate the impact of these measures on employment, as these substitution effects are not corrected.

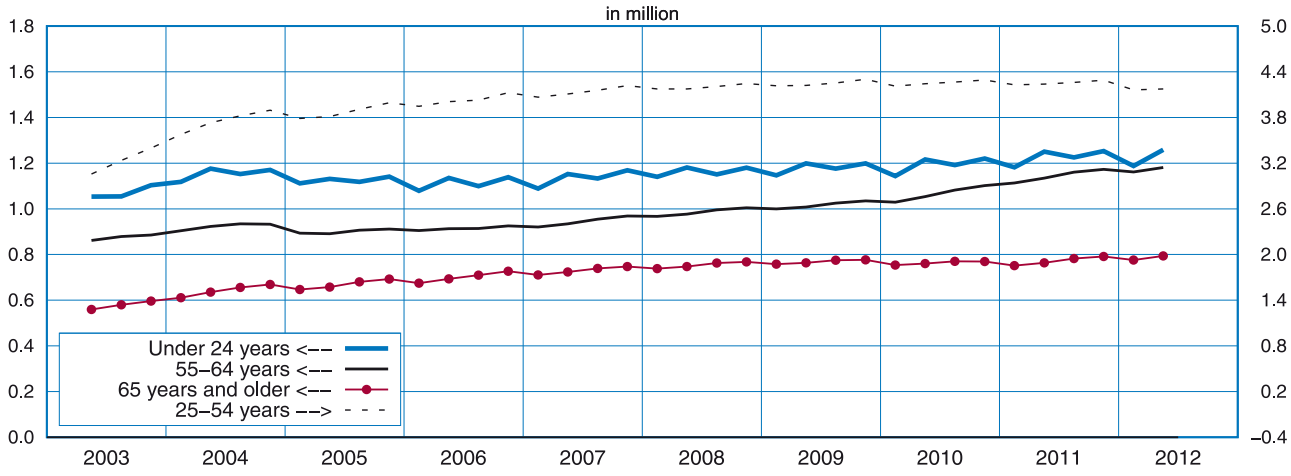
The growth in these kinds of jobs, and more generally the series of reforms to the labour market, go hand in hand with an increase in inequalities. Whereas in 2000, the median net income represented 1.7 times the net income of the first

10 - Number of mini-jobbers



Source : Bundesagentur für Arbeit

11 - Number of mini-jobbers paid little by age



Source : Bundesagentur für Arbeit

decile of income distribution, in 2011, this ratio had risen to 1.85 (DIW Berlin, SOEP). This increase in income inequalities concerns both the unemployed and those in work. The proportion of unemployed whose standard of living is lower than the poverty line rose from 41% in 2005 to 68% in 2011 (Eurostat). It is difficult to distinguish the global increase in income inequalities for salaried workers, as there is no data covering employment as a whole. Nevertheless, for people with a full-time job, the ratio between the median of net wages and the first decile increased from 1.48 in 2000 to 1.59 in 2010. Moreover, the number of part-time workers has increased considerably: the employment survey estimated that between 2000 and 2011 there had been an increase of 1.1 million.

Major adjustment to hours worked per capita in 2009...

In order to understand the major increase in employment since 2005, it is better to model the number of hours worked, which is a better reflection of the quantity of work used in the economy. It has also increased substantially since 2005, even though, in the long term, the number of hours worked per capita in Germany has fallen *(see Graph 12)*, as they have in most industrialised countries.

In 2008-2009, it was the number of hours worked per capita, rather than employment, which played an important buffer role. Numbers did indeed fall drastically: on the one hand, the short-time working system was widely used by German industrial companies, and on the other, these companies applied internal flexibility where possible *(see Box 2)*.

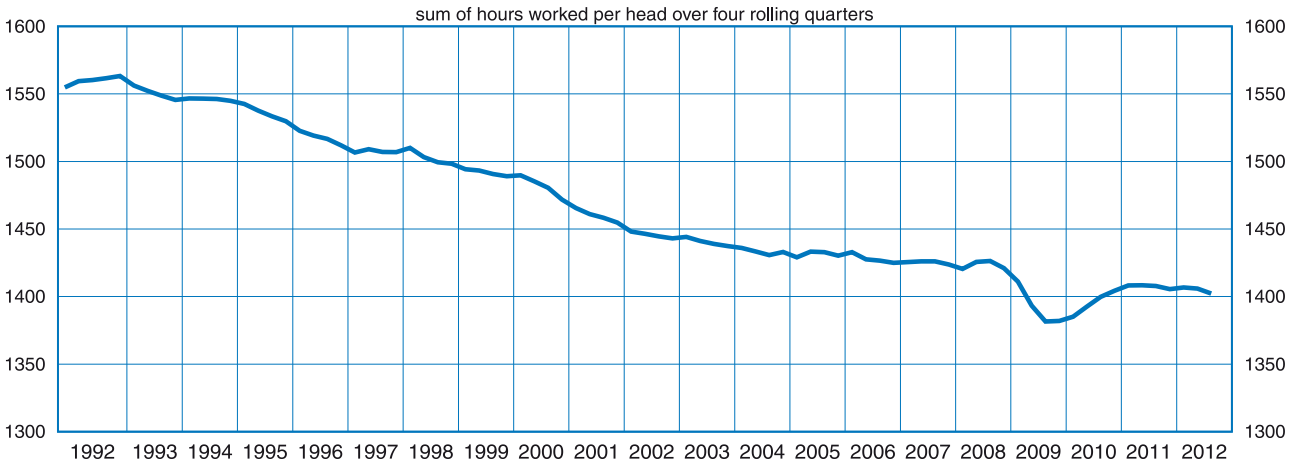
... but the drop was only temporary, which does not explain the persistent dynamism of the employment figures

However, this movement was only temporary and from 2011 onwards, the number of hours worked per capita has resumed its original trend. For example, the use of short-time working, which had reached a peak of 1.5 million in 2009, returned to its lowest point by the end of 2012, of around 70,000. This flexibility in hours worked does not therefore account for the steady drop in the level of unemployment.

Econometric modelling of hours worked indicates...

To estimate the contribution of the growth of economic activity to changes in the total number of hours worked in recent years, it is useful to apply econometric modelling which describes the productivity cycle, i.e. adjusting the quantity of work to the activity *(see Box 4)*. In the long term the volume of hours worked depends on underlying activity trends and gains in productivity and also the cost of labour. There is a certain time lag in adjusting to this trend, which gives rise to short-term fluctuations, called the «productivity cycle».

12 - Hours worked per head in Germany



Source: Destatis, INSEE

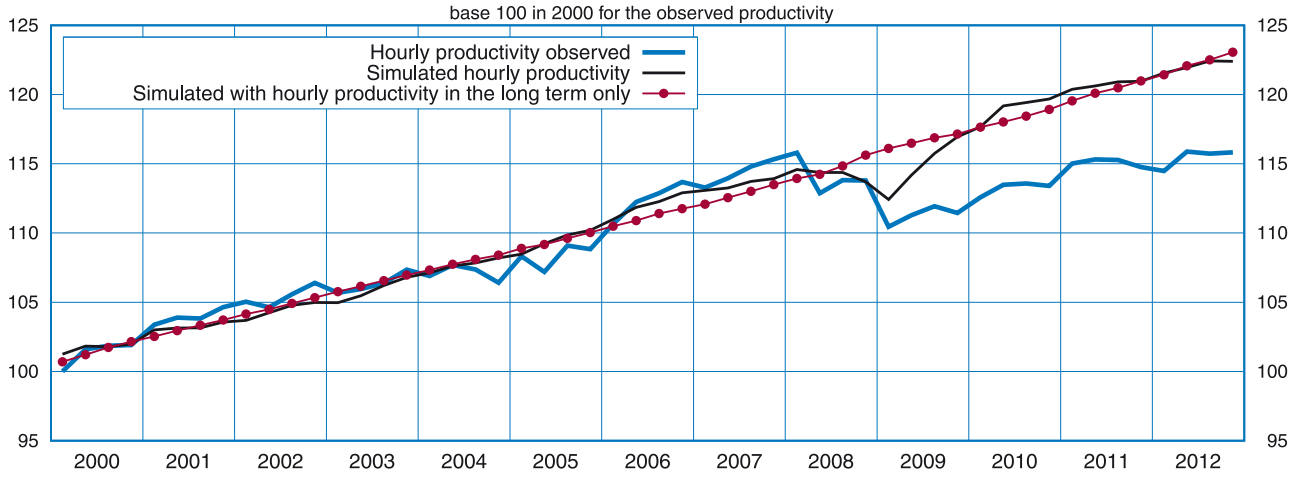
... that in 2012, the volume of hours worked was much greater than expected

Firstly, the hourly productivity observed today is much lower than the simulation by the model *(see Graph 13)*. This therefore indicates either a temporary surplus of hours worked, or a break in the rhythm of the productivity trend. Thus employment was maintained and unemployment was reduced in Germany not only because of the relatively good level of activity since 2005, but also because employment showed a stronger resistance than expected in the period of crisis.

This divergence appeared from 2009

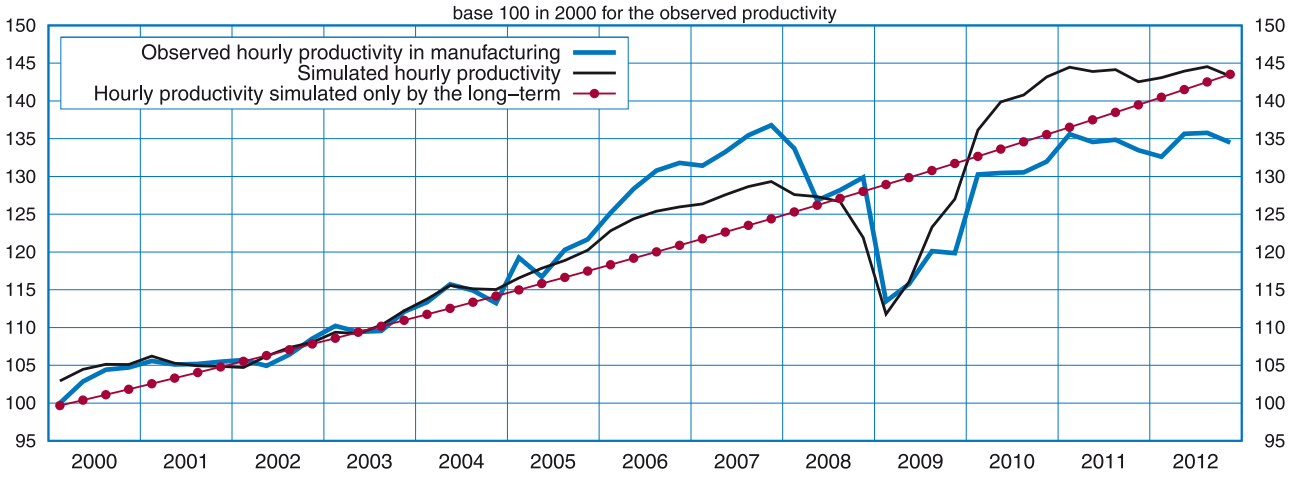
The evolution in productivity and hence the adjustment of the number of hours worked up to and including 2008 are described relatively well in the model *(see Graph 14)*. In 2006 and 2007, apparent productivity was significantly higher than the long-term trend. Given the acceleration in activity during these years, companies chose to limit recruitment by using available productivity margins with the staff already in place, which stimulated workers' apparent productivity, including in hourly terms (Burda and Hunt, 2011). This is «normal» behaviour for companies in a period of positive demand shocks. The drop in hourly productivity in 2008 was a mirror image of the earlier behaviour: when activity drops suddenly, employment adjustment is lessened.

13 - Real and simulated hourly productivity



Source: Destatis, INSEE

14 - Real and simulated hourly productivity in the manufacturing sector



Source: Destatis, INSEE

Box 4: Equations for hours worked

1. Modelling hours worked for the entire economy

The employment equation used for Germany models the relationship between hours worked by everyone in employment (employees or free-lance), in all sectors, and a standard set of explanatory variables: gross domestic product, the real hourly cost of wages and a time trend, representative of underlying productivity gains. This is an error correction model, which describes short-term adjustment to a target long-term adjustment. Data were available from 1991 and the start of the estimation period was in Q4 1994. It was decided to stop at Q4 2008, in order not to include the crisis years. The usual tests were carried out (*Dickey-Fuller, Elliott-Rothenberg-Stock* and *Kwiatkowski-Phillips-Schmidt-Shin*) with the result that the series were considered to be non-stationary, even though the small number of observations did not allow for a very clear-cut conclusion. Since there were relatively few observations, it was decided that a one-step estimate would be preferable. The long term and the short term were therefore estimated simultaneously, but the non-stationarity of the series was taken into account to test the significance of the error correction term [1].

The estimated equation was as follows:

$$\Delta heures\_trav = 1.3 - \underset{(-3,7)}{0.4}*(heures\_trav_{t-1} - pib_{t-1}) - \underset{(c)}{0.05}*csphr_{t-1} - \underset{(-3,2)}{0.3}*Eff + \underset{(3,8}{0.5}*\Delta pib_t$$

Values from the Student's t-tests are in brackets.

(c): coefficient constraint

The significance of the error correction term, tested with tables used by Ericsson and MacKinnon (2002), was accepted at a threshold of 10% and would be accepted at a threshold of 0.1% if the series were stationary. Variables in lower case letters refer to logarithms:

- heures_trav is hours worked calculated from German national accounts,
- pib is the German GDP,
- csphr is the real cost of labour per hour worked,
- Eff is hourly underlying productivity gains. These are estimated at 0.4% per quarter, or 1.6% per year.

The equation for the long term is therefore:

$$heures\_trav = 3.4 + pib - 0.12*csphr - 0.88*Eff$$

The sum of the coefficients that correspond to the cost of labour and efficiency is constrained to -1.

This relationship can also be written as an equation of productivity:

$$pib\text{-}heures\_trav = -3.4 + 0.12*csphr + 0.88*Eff$$

2. Long-term behaviour in the manufacturing sector and market services

Manufacturing sector

The same procedure was used to model employment in industry.

The equation, estimated from the beginning of 1992 to the end of 2005, is as follows:

$$\Delta heures\_trav\_manuf = \underset{(-4,2)}{1.1} - \underset{(-3,9)}{0.3}*(heures\_travt\text{-}1 - va\_manuft\text{-}1) - \underset{(-2,4)}{0.2\%}*Trend - \underset{(3,1)}{0.3}*\Delta heures\_trav\_manuft\text{-}1 + 0.3*\Delta va\_manuft$$

where:

- heures_trav_manuf is hours worked in the manufacturing industry
- va_manuf is value added in the manufacturing industry
- Trend is productivity, modelled by a trend estimated by the model (productivity gains are estimated at 0.7% per quarter, or 2.8% per year).

Hence the corresponding equation for the long term:

$$heures\_trav\_manuf = 3.5 + va\_manuf - 0.7\%*Trend$$

Market services

Regarding services, the estimate from an employment equation on the model of the total employment or manufacturing employment equation was not conclusive, as the usual tests (*Ericsson* and *MacKinnon*, 2002) rejected the significance of the error correction term. ■

(1) *Ericsson* et *MacKinnon* (2002)

On the other hand, hourly productivity should have picked up from 2009. However, it has gradually become separated from productivity as simulated in the equation. Thus it was from this date that behaviours appeared that were different from what was expected, and hence there were «extra» jobs, estimated at over 5%.

Very different changes in productivity from one sector to the next

Changes in productivity differ greatly depending on the sectors of activity *(see Graphs 14 and 15)*. While there was a very marked short-term dip in 2008 in the evolution of productivity in the manufacturing sector (the drop from the end of 2007 to the beginning of 2009 reached 30%), there was only a slight levelling off of productivity in market services.

To examine employment behaviour in more detail in each branch, an equation for employment in hours worked has been modelled for the manufacturing sector, based on the model of the equation for all employment *(see Box 4)*. No statistically satisfactory model was obtained for the services sector; however, examining the changes in productivity in this sector in relation to its trend over the last twenty years is already very informative.

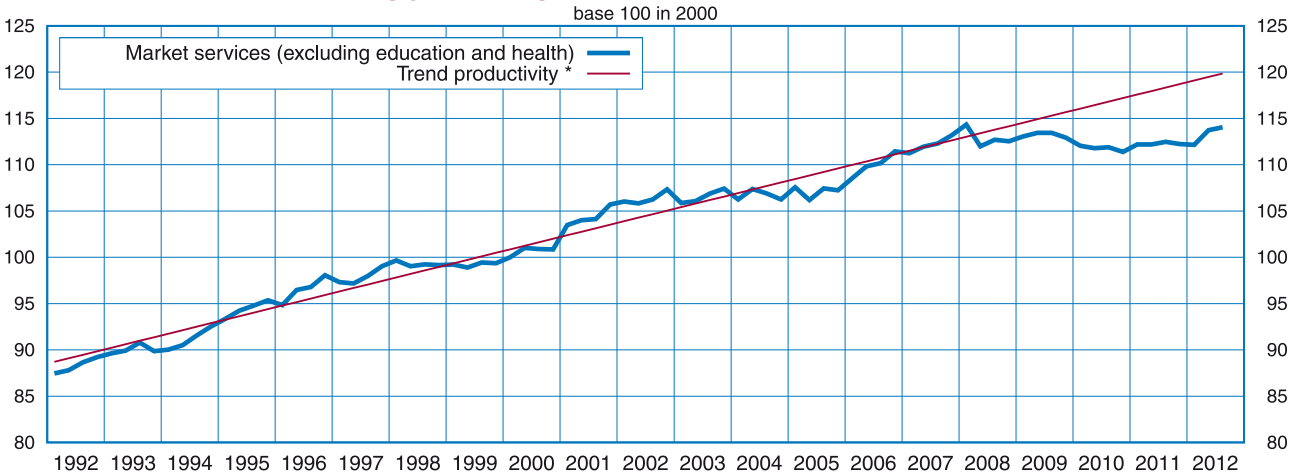
Extra employment in industry since 2010...

If we compare the changes observed and simulated for employment in the manufacturing sector *(see Graph 14)* we see first of all that when activity accelerated in 2006-2007, apparent productivity in the sector was higher than that in the model simulation. In this period of strong growth, the number of hours worked increased less dynamically than had been predicted. As across the entire economy, at the time of the marked slowdown in 2008 and 2009, apparent productivity came back into line with the expected trends in the economic cycle. From 2010, on the other hand, hourly apparent productivity has been significantly lower than simulated productivity. This differential stabilised in 2011 and 2012, with a rise in manufacturing employment of about 6%.

... and also in market services since 2009

In the market service sector, the scale of mismatches with long-term trends also seems to be considerable. Between 1992 and 2009, it appeared that fluctuations in apparent hourly productivity in services around the long-term trend were limited and of only short duration. In particular, the levelling off of productivity from 2003 to 2005, which could be linked to the implementation of the Hartz reforms, was absorbed by the rebound in productivity in 2006-2007. Since 2009 on the other hand, there seems to have been a persistent downward drift. Apparent productivity gains are low and employment in services is about 5% higher than it would be if productivity had followed the trend *(see Graph 15)*.

15 - Hourly productivity observed in the market services sector



* The trend in productivity is estimated over the period 1992 to 2007
Source: Destatis, INSEE

Why did the unemployment rate keep on falling in Germany after 2007?

The interruption in apparent productivity gains contributes to the drop in unemployment in the short term...

If we look at the behaviour of hours worked in Germany, this shows that hourly apparent productivity in industry is currently lower than expected, as it is in the services sector. This «enrichment of employment growth» has contributed, all else being equal, to maintaining a good level of employment and thus to the drop in unemployment over the recent period.

... but not necessarily to a «structural» drop in unemployment

There are two questions to ask here: is this break sustainable and if so, to what extent does it have an effect on the «structural» unemployment rate, which is sustainable in the long term? Counter-intuitively, while a drop in productivity gains can cause a drop in unemployment in the short term, it apparently does not contribute to bringing about a drop in the structural unemployment rate. It may, on the contrary, help increase it if wages are not perfectly aligned with productivity. In fact, in the short term a slowdown in productivity represents, for a given volume of activity, an increase in the demand for work, which thus reduces unemployment and increases workers' bargaining power. The acceleration of real wage growth, which is all the stronger when wages are not closely indexed to productivity, results in turn in a reduction in the demand for labour, so that the unemployment rate returns, at best, to its original level.

A slowdown in productivity may, on the other hand, result in a drop in the structural unemployment rate, if the reason is not reduced productivity gains for workers in employment, but rather due to the composition of the active population, with an increased proportion of the least productive workers, who were previously unemployed. This is what happened in France, for example, in the 1990s with the easing of social contributions on low wages, which resulted in an «enrichment in employment growth».

There are several possible explanations for the drop in productivity gains

In the case of Germany, one can imagine that the interruption in productivity was a result of the effects of the Hartz reforms, especially in services. These reforms reduced contributions on low wages (with notably the creation of mini-jobs and midi-jobs) and encouraged less productive people to join the labour market, especially the service sector. The apparent interruption in productivity would then be due to an alteration in the composition of the workforce. It would then be sustainable at that level and would be the result of a drop in structural unemployment.

Another explanation for the weak productivity gains could be the concerns of German companies in the light of the supposed growing scarcity of labour, linked with the drop in the working-age population, and which will probably accelerate in years to come.2 This probably encouraged companies to retain a higher volume of employment, to the detriment of productivity.3 The low level of investment in capital goods in Germany since the beginning of the crisis (the investment rate has fallen 1.4 percentage points since 2008, compared with 0.4 points in France) is coherent with the hypothesis of a change, albeit temporary, in the structure of production, in favour of the labour factor. This may have been caused by the particularly great uncertainty surrounding business prospects, given the prolonged crisis in the Euro zone.

(2) *See for example the study by McKinsey (2008), forecasting for 2020 a deficit of 6.1 million people in the labour market*
(3) *cf. Ziemann, (2010)*

It is likely that the drop in structural unemployment preceded the drop in unemployment

In the short term and for whatever reason, the interruption in the apparent gain in productivity, all things being equal, contributed to the continued decline in unemployment in Germany during the crisis. On the face of it, however, it had no favourable causal effect on long-term unemployment. In this part we try to determine any indications of a drop in long-term unemployment in Germany, and identify the causes.

Greater fluidity in the labour market

The aim of the reforms implemented in Germany was to «activate» the unemployed more, by making the conditions for access to unemployment benefit more strict and by considering that any job could be deemed acceptable for the long-term unemployed, regardless of the qualification required or the location. The aim was also to improve support for job seekers, through a reform of the Public Employment Service. It was hoped that these policies would to accelerate «matches» on the labour market, between jobs and workers.[4]

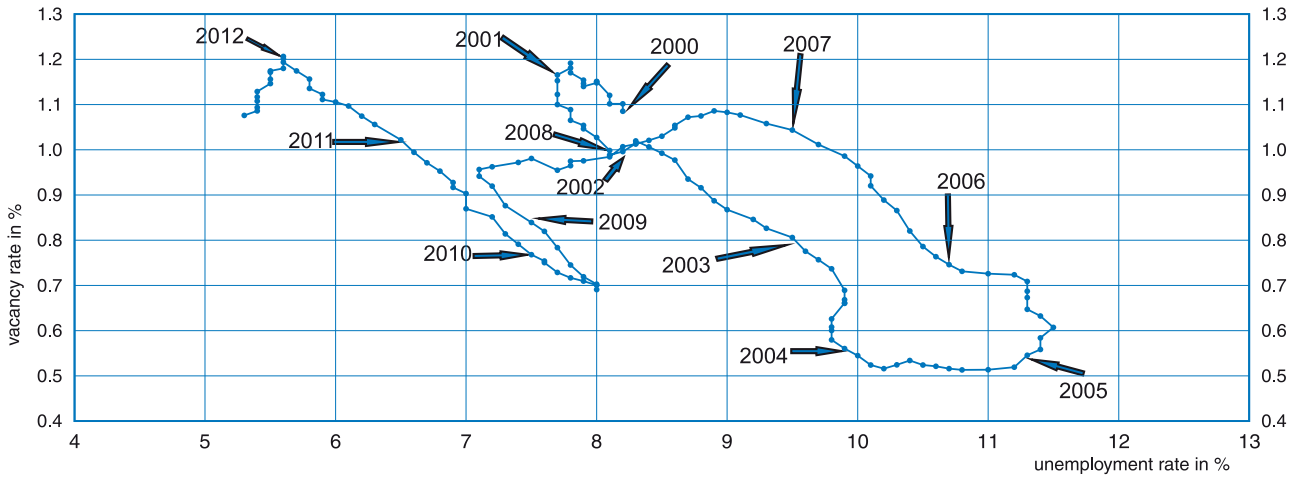
In the absence of structural changes in the labour market, macroeconomic theory suggests that a stable decreasing relationship exists between the number of vacant jobs and the number of unemployed. This relationship is called the Beveridge curve *(see Graph 16)*. If the curve shifts to the right, this is synonymous with a deterioration in the functioning of the labour market: for the same rate of vacant jobs, the unemployment rate is higher. Conversely, a shift to the left indicates a better match between the unemployed and vacant jobs, and hence a labour market that is functioning more efficiently.

Analysis of the curve raises the following points:

- the implementation of the Hartz reforms at the beginning of 2003 seems to have had an immediate effect, with vacant jobs decreasing by a third during the year 2003, while the unemployment rate increased hardly at all, - conversely, in 2004, we observe a large increase in the number of unemployed, while the number of vacant jobs remained stable,- finally, from the beginning of 2007 to mid-2008,

(4) With no guarantee that these matches will be of better quality, if insufficient time is spent looking for a job

16 - Beveridge curve



How to read it: The rate of vacant jobs is calculated by dividing the number of vacant jobs by the sum of total employment and vacant jobs

Sources : - vacancy employment: Bundesagentur für Arbeit,désaisonnalisatoin Bundesbank
- total employment: quarterly accounts
- unemployment rate: Destatis, employment survey

Why did the unemployment rate keep on falling in Germany after 2007?

Box 5: Wages equation

The equation presented here models the cost of labour, derived from the national accounts. It can be calculated per capita or per hour worked, depending on whether the payroll is divided according to paid employment or the total number of hours worked by the employees. The wage costs are real after division by the value added deflator.

To measure the impact of employers' contributions and wage costs, the concept of the «tax wedge» was used. This corresponds to the ratio between the payroll and wages net of contributions and wage tax. Two comments on its evolution over ten years (see Graph):

- The creation of mini-jobs and midi-jobs at the beginning of 2003 led to a reduction of the tax wedge, as these new jobs were taxed considerably less than standard jobs;
- In 2007, the drop in contributions by 2 points was compensated by a strong increase in the wage tax, such that its downward impact on the tax wedge is barely discernable.

The equation presented here models the cost of labour. Given the relatively short estimation period (1992-2004), long-term and short-term relations are estimated simultaneously.

The model, estimated in one step, is as follows:

$$\Delta cspt = 4.3 - 0.5*(cspt_{t-1} - def\_conso_{(t-1)}) - 0.05*Chômage_{t-1} + 0.12*cfs_{t-1} + 0.04\%*Trend + 0.2*\Delta cfs_t - 0.2*\Delta cspt_{t-2} + 0.4\Delta def\_conso_t$$

(–3,8) (–4,1) (2,3) (3,1) (2,4) (-2,4) (1,7)

Variables in lower case letters refer to logarithms

- cspt is wage costs per capita (payroll divided by paid employment)
- def_conso is the consumption deflator
- Chômage is the rate of unemployment as used by ILO by level
- Trend is a trend

The equation for the long term is therefore:

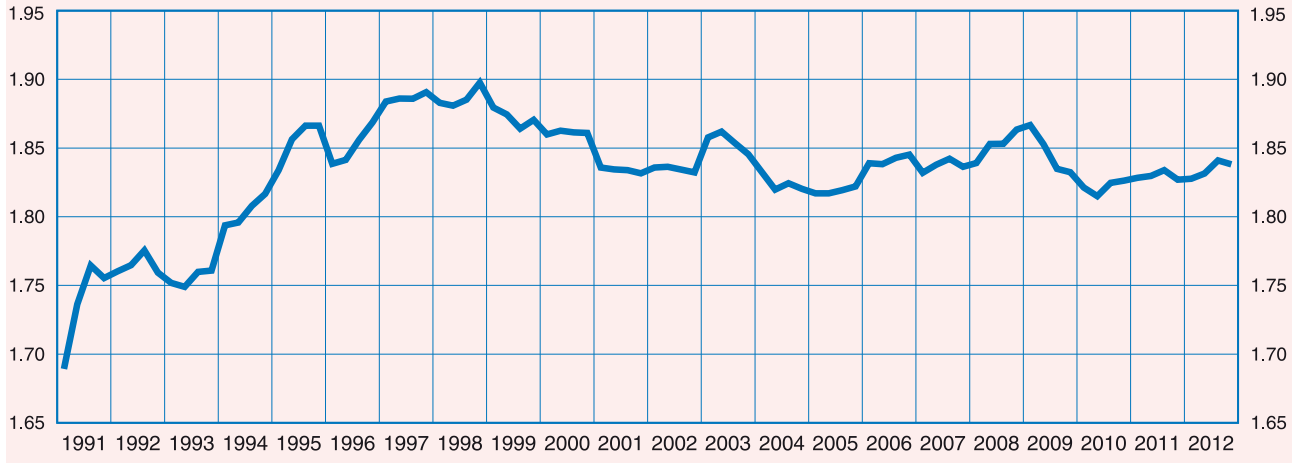
$$cspt - def\_conso = 8.9 - 0.01*Chômage + 0.07\%*Trend + 0.3*cfs$$

Concerning the estimation period, two facts emerge:

- firstly, the quarterly trend for real wage costs is around 20% less than that for productivity (0.07% compared with 0.4%, see Box 4), which therefore takes wage restraint into account. In practice, wage restraint in fact corresponds to a sub-indexing of nominal wages in relation to both consumer prices and productivity gains, thus globally it corresponds in value to productivity. However, no model considering these two sub-indexations was able to produce a statistically satisfactory estimate. It was therefore decided to model real wages, thus clearly forcing wage elasticity to match unit prices.
- secondly, indexing to the tax wedge was not unitary. Once again, attempts to force this unit indexing were rejected statistically, which means that a drop in contributions did not correspond to an equivalent drop in the cost of labour, as employees anticipate this drop as a reduction in future income. It is possible, however, that the weakness of the estimated indexing is due to the very uneven nature of the tax wedge series, which may hamper its identification.

The model is valid at a threshold of 10% (and would be at a threshold of 0.1% if the series were stationary). ■

Tax wedge



Source : Destatis, INSEE

the curve clearly shifts to the left, unemployment numbers drop by 1 million, and vacant jobs also decrease.

Thus even though the rate of vacant jobs is the highest today that it has been since figures were available, and in fact is more than double its 2004 level, the improvement in the functioning of the labour market seems obvious, at least since the beginning of 2007.

This result is consistent with the estimate by Krebs and Scheffel (2013) who used a mock-up of the labour market and evaluated the effect of the Hartz IV «activation» measures on the unemployment rate *(see Box 2)* at -1.4 points.

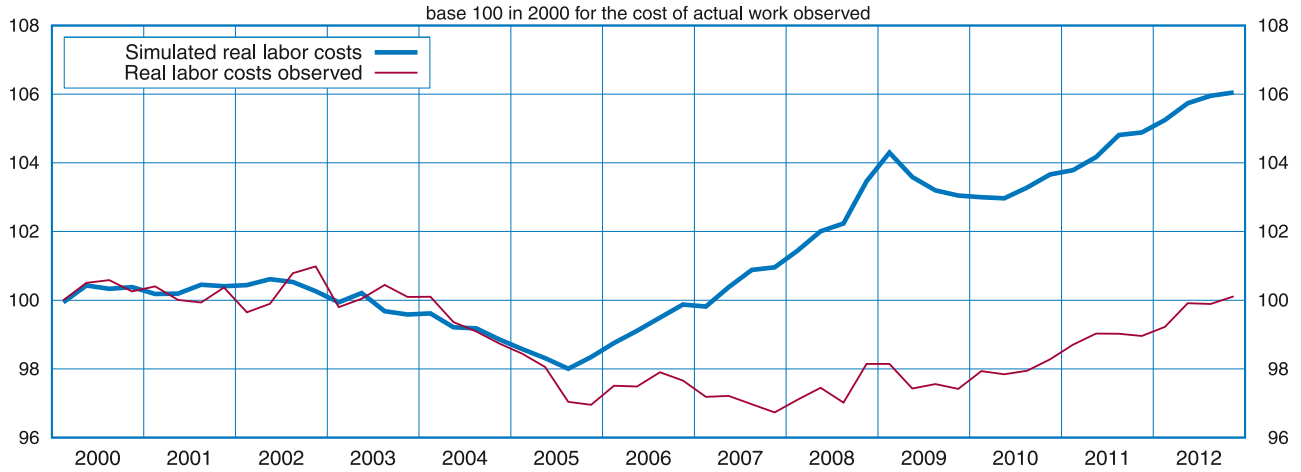
Wage restraint has persisted since the second half of the 1990s...

The cost of labour in Germany has been particularly lacking in dynamism since the second half of the 1990s. Real wages decreased by 0.7% from 1996 to 2007, compared with an increase of +17.3% in France. In particular, this wage restraint reflects the fact that real wages did not follow productivity gains. This can be seen from the econometric modelling described in this paper (see Box 5). The model shows the long-term adjustment in the level of real wages to productivity, to the «tax wedge» and to the unemployment level. The apparent indexation of wages to productivity is very low, around 20%.

In addition, the fall in unemployment that has occurred since 2005 has not resulted in an acceleration in wages, hence the separation in wages observed in relation to expected wages on the basis of previous behaviours from 2005 to 2009 *(see Graph 17)*. This split may be linked with the tightening of the unemployment benefit system put in place by the Hartz IV reform: by reducing employees' expectations of the income they would receive if they lost their job, this hardening managed to push them into staying in their jobs to the detriment of wage rises.

Today this gap may no longer be increasing, but it still persists: wages are still lower by almost 6% than the model forecast. Thus after the wage restraint episode, the acceleration of wages in 2011 and 2012 is not the result of a catch-up phenomenon since wages are increasing at the rhythm predicted by the model.

17 - Labor costs * observed and simulated



* The cost of labor is deflated by the consumption deflator.
Source: Destatis, INSEE

Why did the unemployment rate keep on falling in Germany after 2007?

.... and leads to a fall in structural unemployment

The very low level of wages being indexed to productivity gains in theoretical models of the labour market, such as WS-PS (Cotis, Méary and Sobczak, 1998), indicates a reduction in the structural unemployment rate. This reduction must therefore have occurred before 2005, when the effective unemployment rate was high, on account of sluggish growth in Germany. The fact that the large drop in the effective unemployment rate in Germany since 2005 has not given rise to an acceleration in real wages confirms this result.The effect of other determinants of structural unemployment traditionally identified in theoretical models of the labour market (social contributions, domestic terms of trade, real cost of capital) would have been less marked.

The tax wedge has little influence on wage formation and hence probably on unemployment too...

In theory, whenever the tax wedge causes a divergence between employee demands and the cost of factors of production, this has an effect on the structural unemployment rate. Since the beginning of the 2000s, social contributions have been reduced in Germany, by around 5 points against the net wage. This reduction, which brought the level back to that of the middle of the 1990s, was concentrated at the beginning of the 2000s, for the most part before 2003. The impact of the Hartz reforms (and especially of the creation of mini-jobs and midi-jobs) is discernable, with a drop of around three points between 2003 and 2004, but it was offset by other movements in the opposite direction (see Box 5).

In fact, when wages are modelled, this could suggest that the majority of employees consider social contributions as deferred income since indexing wages to the tax wedge is much lower per unit. Consequently, the impact of any drop in charges on the structural unemployment rate would be low.

... like the domestic terms of trade

Just like the tax wedge, the difference between consumer prices and value added prices (called the domestic terms of trade) in theory influences the structural unemployment rate. It introduces a gap between the real cost of labour for a company, and employees' real income. In the 2000s, consumer prices increased in Germany faster than value added prices (+0.6% per year on average), which would tend to increase the structural unemployment rate. The increase in the VAT rate in 2007 does not appear to have had any particular effect, as part of this was absorbed by company profit margins. Here again, the econometric estimate does not show that the terms of trade had any effect on wage formation and hence ultimately on the structural unemployment rate.

The real cost of capital could also have contributed to the drop in the structural unemployment rate

A third determinant of the structural unemployment rate is the real cost of capital. At the beginning of the 2000s, the real cost of capital decreased less in Germany than in the other Euro zone economies, because it was already at a low level. Conversely, no increase in the real cost of capital has been observed in Germany since the beginning of the crisis, since rates have remained very low, and credit has tightened less than elsewhere in Europe. In addition, corporation tax has been reduced significantly in recent years (in 2008, corporation tax rates dropped from 39% to 30%). The evolution in the real cost of capital has therefore been able to contribute favourably to Germany's recent performance in terms of its unemployment rate. In particular, it has made the drop in the margin rate recorded since 2009 more acceptable for companies, whereas conversely, in Spain, the margin rate and the real cost of capital have grown hand in hand.

Is the decrease in underlying productivity gains a risk for unemployment?

We have seen above that the partial indexing of wages to productivity gains since the second half of the 1990s appears to have been a determining factor in reducing the structural unemployment rate in Germany. Symmetrically, if the stagnation in productivity observed since 2008 were to persist, in parallel with growth in real wages, the structural unemployment rate would rise once more. However, this is a fairly unlikely scenario: as seen at the end of part three, the slowdown in productivity is probably the result of transient factors. ■

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