

## The US labour market in the current cycle

Employment in the United States declined sharply during the recent recession and increased again only hesitantly in the nascent upswing. Such pronounced labour market weakness is striking in historical terms as well as in an international context and is likely to have placed an additional strain on macroeconomic developments in the past few quarters. A large number of sometimes widely differing arguments have been put forward to explain this: in particular, major advances in productivity, increased structural change, and financing constraints of small firms. Nevertheless, none of these factors is likely to provide an adequate explanation of recent developments on the labour market. Productivity growth has accelerated considerably at times, then only to slow down again perceptibly. There are no indications of a more rapid pace of technological progress. There is no doubt that some economic sectors and regions were more severely affected than others by the recession. Overall, however, job losses were spread quite broadly across sectors and federal states. Owing to their dependence on banks in matters of financing, small firms probably suffered more from banks' stricter credit conditions than larger firms did. Even so, they were by no means more reluctant to recruit new staff.

So far, however, little attention has been paid to explanatory approaches that focus on enterprises' strategy for lowering wage costs in the recession. The data, however, demonstrate that the adjustment during the downturn was effected quite substantially by means of employment and scarcely through wages. The newly acquired room for manoeuvre in the incipient recovery was then used mainly for higher wage incomes and less for increasing the number of jobs. Despite a high level of unemployment and sometimes even falling prices, nominal hourly wages were persistently rising, which meant that there were no cuts in real wages, which might have contributed to a clearing of the labour market. This is consistent with studies based on micro data, which attest to a high degree of downward nominal wage rigidity in the US in comparison with other countries. In Germany, by contrast, it was probably not least closer cooperation between employers and employees which made it easier to adjust costs in the recession without a massive loss of jobs.

## The recent labour market weakness in a historical context

*Labour market weakness especially marked over the past few years...*

There has been a very marked development in the US labour market over the past few years: employment declined sharply in the wake of the economic downturn and new jobs have been created only very slowly in the ensuing recovery. While real gross domestic product (GDP) shrank by more than 4% between the cyclical peak in the final quarter of 2007 and the trough in the second quarter of 2009, 6¼% of all non-farm jobs had been cut by the time employment bottomed out nine months later than overall output. At the end of 2010, the volume of goods and services produced in the United States was back up to its pre-recession level, but 5½% fewer jobs were needed for this than three years earlier. This means that the labour market is likely to have placed an additional strain on the development of the economy as a whole. This might also help to explain, above all, the performance of private consumption: in contrast to earlier recessions, it fell markedly during the downturn and was initially on no more than a moderate upward trend during the recovery.<sup>1</sup>

*... by historical and international comparison*

How sharp the labour market adjustment was in the recession is made clear by a historical comparison. On an annual average, 2009 saw not only the sharpest rise in the unemployment rate (3.5 percentage points) since 1949, but also the sharpest fall in GDP (-2½%). Based on a simple linear regression, historical experience would have suggested a considerably weaker increase in unemployment given such a decline in overall output.<sup>2</sup>

What is also striking, however, is the poor performance of the US labour market by international comparison. Whereas export-oriented economies, such as Japan and Germany, suffered a perceptibly sharper slump in output in the wake of the recent recession than did the United States, their employment losses were more limited.<sup>3</sup>

Various approaches have been suggested in order to explain this development, which is unusual in historical and international terms. In particular, major advances in productivity as well as increased structural change owing to the need for adjustment in the construction sector have been cited as possible reasons, as have – in view of the financial crisis – potentially severe financing constraints of small firms. Below, these propositions are scrutinised in the light of the empirical evidence. Moreover, a look at the adjustment behaviour of wages and profits sheds light on an area which has tended to be neglected up to now, at least in the economic policy debate.<sup>4</sup>

*Explanatory approaches with varying focus*

<sup>1</sup> See Deutsche Bundesbank, The current economic upturn in the United States in comparison with earlier phases of recovery, Monthly Report, August 2010, pp 18-19.

<sup>2</sup> Even though the relationship between GDP growth and a change in the unemployment rate is known as one form of "Okun's Law", this is not a structural characteristic of the US economy but merely a statistical correlation that fluctuates over time. See E S Knotek, How Useful is Okun's Law?, Federal Reserve Bank of San Francisco, Economic Review, 2007 Q4, pp 73-103.

<sup>3</sup> See Deutsche Bundesbank, Labour markets in the global recession, Monthly Report, November 2009, pp 20-21.

<sup>4</sup> Shimer, in commenting on an academic paper, has highlighted the particularity of wage developments. See R Shimer (2010), Comment on The Labor Market in the Great Recession, Brookings Papers on Economic Activity, Vol 2010, No 1, pp 57-65.

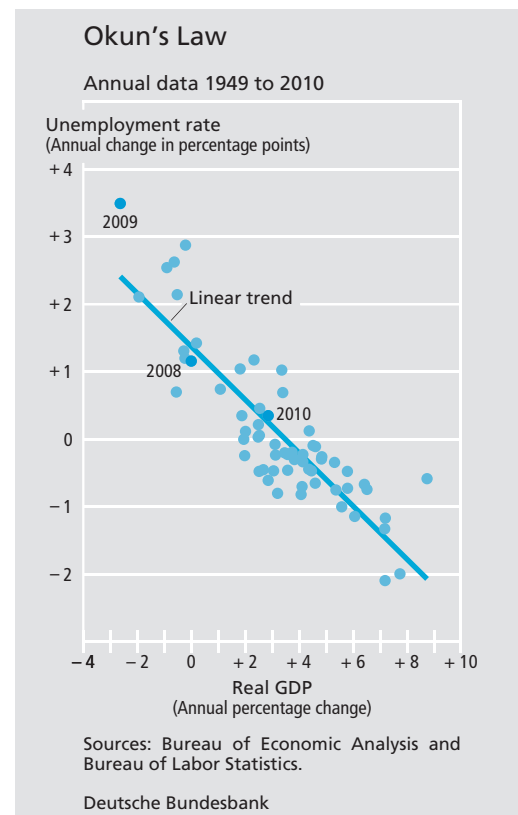
## Aggregate demand and uncertainty

*Enterprises' weak labour demand...*

Some observers believe that the weakness of the labour market essentially reflects cyclical factors. A lack of demand for firms' products, so the argument goes, depresses its need for labour. All that is needed to revive the labour market is a faster pace of aggregate growth, as can be initiated by additional monetary and fiscal policy stimuli, for example. Alternatively, it is often argued that it is not the pace of economic growth itself, but rather a high degree of uncertainty about future overall economic output that weighs down on enterprises' demand for labour. In this case, unemployment is likely to be considerably less receptive to economic policy stimuli. It is claimed that enterprises and households were additionally unsettled by government interventions and reforms, such as those initiated in financial supervision and health-care, for example.

*...but sharp expansion in investment*

Despite differing implications for the character of unemployment and the success of macroeconomic stimuli, both theories suggest that the given identified strain is unlikely to be reflected solely in the labour market. Enterprises suffering from a lack of demand or a high degree of uncertainty, so the reasoning goes, take account of this not only in their employment intentions but also, first and foremost, in their investment decisions, too. After adjustment for differing average rates and volatilities, there is historically a surprisingly close correlation between employment growth and expansion of investment in machinery and equipment, which held even during the severe economic slowdown in the



second half of 2008. During 2009, however, firms' real spending on equipment and software moved on to a steep path to recovery, with the number of jobs in the private sector initially lagging far behind in comparison. Therefore, in order to explain the no more than hesitant improvement in the labour market, one has to look not only for cyclical factors but also other influences that have driven an unusual wedge between investment and employment in enterprises' decision-making.

## Productivity and technological progress

The fact that employment has performed less well than overall output over the past two years points to a matching rise in labour productivity. There was still a rise even if output

*Following anti-cyclical reaction at the start of the millennium, productivity...*



per hours worked is taken as a point of reference rather than output *per capita*, which is reminiscent of the “jobless recovery” of 2002 and 2003.<sup>5</sup> At that time, the faster pace of technological progress, not least in the information and communications sector, raised the employment threshold to such an extent that aggregate growth was insufficient to create new jobs. Before this, a surge in productivity during the recession year 2001 had already broken through the cyclical pattern typical of the USA.<sup>6</sup> Usually, the upward movement in productivity weakens in the wake of a cyclical downturn because, for instance, enterprises hoard labour and thus deploy it less efficiently for a time. In the first few quarters of the subsequent overall economic recovery, however, the foregone in-

creases in productivity are rapidly regained so that output per hour returns to its trend path.

The impression that there are considerable parallels between recent labour market developments and those in 2002 and 2003 needs to be corrected, however. In actual fact, recent developments appear to follow more the typical procyclical pattern rather than tie in with experience at the beginning of the millennium. This becomes even clearer when looking at developments in individual years rather than the cyclical phases dated by the National Bureau of Economic Research (NBER). For example, according to the Bureau of Labor Statistics (BLS), hourly productivity in the non-farm business sector fell, in fact, by ½% year on year in the final quarter of 2008, after increasing by 2½% during 2007, which corresponds to the average rate for the period from 2000 to 2007. By the end of 2009, however, hourly output had shot up within four quarters by 6½%, posting the sharpest increase since 1962.

Productivity gains can be due to various factors. Applying a Solow growth model, the BLS estimates, on an annual basis, to what extent productivity gains are due to an improvement in capitalisation or a higher quality of the factor labour. The remaining amount is ascribed to a residual which combines the ef-

*... recently back to its typical procyclical pattern*

*Sharp productivity surge less a cause than a symptom*

<sup>5</sup> D J Wilson (2010), Is the Recent Productivity Boom Over?, Federal Reserve Bank of San Francisco, Economic Letter, No 28.

<sup>6</sup> See R J Gordon (2003), Exploding Productivity Growth: Context, Causes, and Implications, Brookings Papers on Economic Activity, Vol 2003, No 2, pp 207-279, and R J Gordon (2010), Okun’s Law and Productivity Innovations, American Economic Review, Vol 100, No 2, pp 11-15.

fect of other relevant variables including, in particular, technological progress.<sup>7</sup> According to the current BLS estimate for the private (non-farm) business sector, however, this Solow residual, or “total factor productivity”, showed virtually no change in 2009 compared with the previous year, when it had declined by 1%. By contrast, it increased by just under 1% on average for the period 2005 to 2007 and even showed an annual increase of 2½% in the period 2002 to 2004.

Instead, three-quarters of the 3¾% increase in output per hour worked in 2009 was due to higher capital intensity. According to the BLS, this was the largest contribution that this component has made to growth in labour productivity during the post-war period. However, the main reason for this was a larger cutback in employment than in plant and equipment and not a large-scale increase in capital. For that reason, the surge in productivity in 2009 is likely to be not so much the cause of the weakness on the labour market but rather a reflection of it. Even if the productivity gains of the following year had been driven to a greater extent by technological progress, a persistent upward trend in private employment has nonetheless now become established. Fears of a repetition of the long period of jobless growth in 2002 and 2003 have not been borne out.

### Beveridge curve and structural change

In this connection, a lot of attention has been paid to the Beveridge curve, which is a graphical representation of the relationship between

### Cyclical pattern of labour productivity

Percentage change in output per hour worked (seasonally adjusted) in the non-farm business sector during certain periods

| Time/period                   | 2008-09 recession |     | 2001 recession |     | Average of 8 preceding recessions |
|-------------------------------|-------------------|-----|----------------|-----|-----------------------------------|
| 4 quarters before recession   |                   | 2.6 |                | 2.9 | 1.4                               |
| Recession                     | 1                 | 1.8 | 1              | 5.2 | 0.2                               |
| 4 quarters after recession    |                   | 4.0 |                | 3.1 | 4.6                               |
| 5-12 quarters after recession | 1,2               | 2.4 | 1              | 3.2 | 1.8                               |

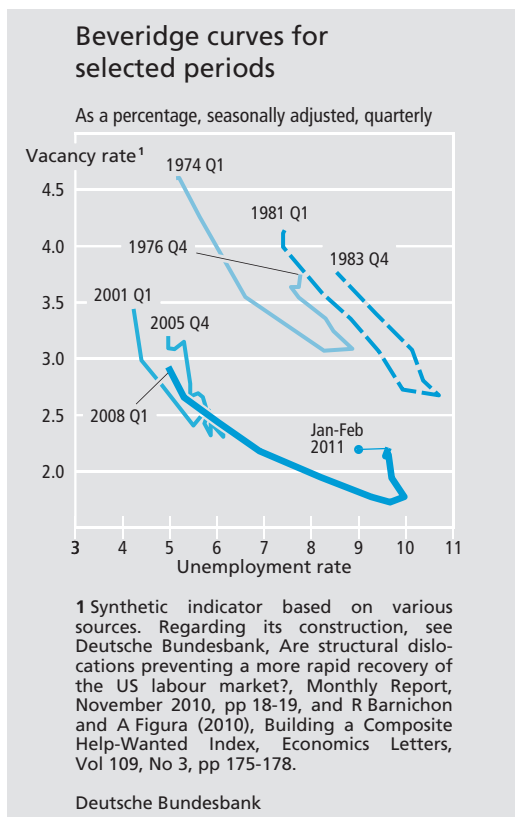
Source: Bureau of Labor Statistics and Bundesbank calculations. — 1 Annualised rate. — 2 Only based on second half of 2010.

Deutsche Bundesbank

unemployment and the job vacancy rate. In a period of overall economic expansion, the unemployment rate declines accompanied simultaneously by a growing number of vacancies so that the labour market moves along a given Beveridge curve. If the matching process between labour supply and labour demand becomes less efficient, however – perhaps because the unemployed do not possess the required characteristics and skills owing to more rapid sectoral and regional structural change in the economy – there is an increase in the number of vacancies without a matching decline in the unemployment rate, which shifts the Beveridge curve outwards.

*Rising number of vacancies without a matching decline in unemployment...*

<sup>7</sup> See P B Meyer und M J Harper (2005), Preliminary Estimates of Multifactor Productivity Growth, Bureau of Labor Statistics, Monthly Labor Review, June 2005, pp 32-43.



... usual after the economy has bottomed out

In 2010, when a development of this kind was becoming apparent in the BLS data, which go back to the end of 2000, structural distortions were often identified as the cause of the persistently high level of unemployment. Such a conclusion is by no means compelling, however.<sup>8</sup> Indeed, a historical comparison reveals that, after the economy has bottomed out in the United States, there is invariably an anticlockwise movement in the Beveridge curve. This is due to the time lag between vacancies being advertised and filled. As a result, the number of vacancies at the start of an overall economic recovery rises faster than unemployment can fall.<sup>9</sup>

Heightened structural change as an explanation for the sharp rise in unemployment and the lagged recovery on the labour market

ought to be reflected in clear divergences in employment between individual sectors and regions. No such dispersion can be observed, however. In fact, the BLS diffusion index, which measures the percentage of industries with job gains or no change in jobs,<sup>10</sup> shows that the change in employment in both the recent recession and the subsequent recovery was relatively broadly spread across sectors. A quite similar picture emerges if one constructs a diffusion index of regional dispersion, based on the BLS employment data, for the individual federal states and metropolitan areas.

Many observers' perception of increased structural change is likely to be based very largely on the importance they attach to the downturn in the real estate market for the current macroeconomic cycle. Even in 2006, however, at the height of the boom in the housing market, the construction sector's share in overall (non-farm) employment did not exceed 5¾%. This seems moderate given

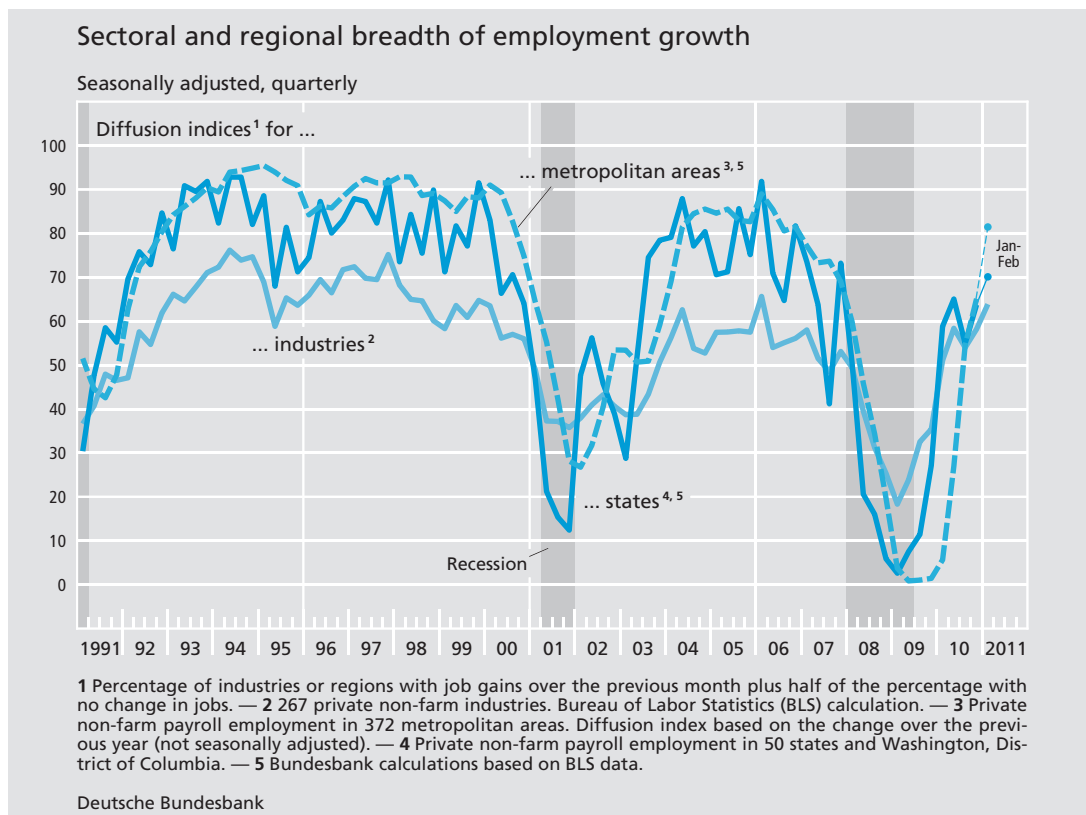
*Widespread changes in employment argue against increased structural change*

*Importance of the downturn in the real estate market probably often overestimated*

<sup>8</sup> See also Deutsche Bundesbank, Are structural dislocations preventing a more rapid recovery of the US labour market?, Monthly Report, November 2010, pp 18-19, and Deutsche Bundesbank, Improved matching on the labour market? – Evidence from the Beveridge curve, Monthly Report, November 2008, pp 54-55.

<sup>9</sup> See B Hansen (1970), Excess Demand, Unemployment, Vacancies, and Wages, Quarterly Journal of Economics, Vol 84, No 1, pp 1-23, as well as O J Blanchard and P Diamond (1989), The Beveridge Curve, Brookings Papers on Economic Activity, Vol 1989, No 1, pp 1-60.

<sup>10</sup> This is based on seasonally adjusted employment in accordance with the Current Employment Statistics (CES) on payroll employment in 267 private (non-farm) industries. The industry is assigned a value of 0%, 50%, or 100%, respectively, depending on whether its employment has shown a decrease, no change, or an increase over a given period. Much like a purchasing managers' index, an index value of 50 signals that the percentages of industries with an increase or decrease in employment are in balance. For information on the construction and significance of the diffusion index, see P M Getz and M G Ulmer (1990), Diffusion Indexes: A Barometer of the Economy, Bureau of Labor Statistics, Monthly Labor Review, April 1990, pp 13-21.



a long-term average of 5% (since 1947) and in view of the peak figures for aggregate employment of 13% in Spain and 13¾% in Ireland. Even considering the spillover effects on other sectors of the economy, the BLS – on the basis of input-output calculations – puts the impact of the recent housing price bubble on employment at no more than 1¼ million to 1¾ million additional jobs, ie roughly 1% of all non-farm payroll employment.<sup>11</sup> Many homeowners' net worth is now negative owing to the fall in house prices; the effect of this on their mobility and thus on structural employment is by no means clear-cut either.<sup>12</sup> Altogether, there is thus much to suggest that the crisis in the US real estate market at least made no dominant contribution to the recent weakness of the labour market.<sup>13</sup>

### Gross flows and the behaviour of small enterprises

The analysis has focused so far mainly on employment change at the national level, as esti-

<sup>11</sup> See K J Byun (2010), The U.S. Housing Bubble and Bust: Impacts on Employment, Bureau of Labor Statistics, Monthly Labor Review, December 2010, pp 3-17.

<sup>12</sup> In theory, it would be possible to put forward arguments for homeowners' negative net worth having both a mobility-reducing and mobility-enhancing effect. Ultimately, however, this question can only be answered empirically. While Ferreira et al (2010) observe a perceptibly reducing impact, Schulhofer-Wohl (2010) attributes this outcome to faulty preparation of the dataset and comes to the opposite conclusion. Nevertheless, this dataset does not yet include the latest findings, which means that the jury is still out on this. See F Ferreira, J Gyourko and J Tracy (2010), Housing Busts and Household Mobility, Journal of Urban Economics, Vol 68, No 1, pp 34-45, and S Schulhofer-Wohl (2010), Negative Equity Does Not Reduce Homeowners' Mobility, Federal Reserve Bank of Minneapolis, Working Paper No 682.

<sup>13</sup> See also E R Rissman (2009), Employment Growth: Cyclical Movements or Structural Change?, Federal Reserve Bank of Chicago, Economic Perspectives, 2009 Q4, pp 40-57.

## Need for revision of monthly employment estimates in the US

Financial market participants and analysts from both private and public institutions always pay close attention to the Bureau of Labor Statistics' (BLS) monthly estimates of non-farm payroll employment in the US. One important reason for this is the immediacy of these data. BLS generally publishes its estimate as early as the first Friday of the month following the reference month. However, it is often overlooked that these figures are merely a preliminary estimate and that such timely publication comes at the cost of sometimes extensive revisions.

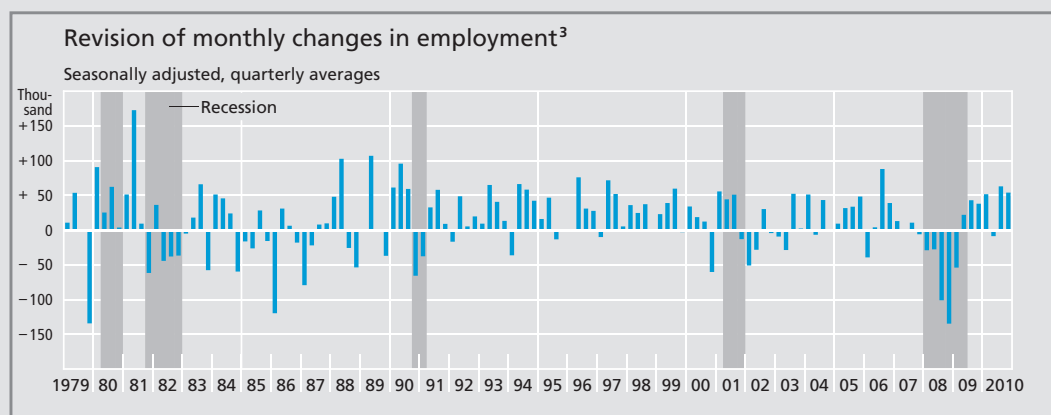
The employment estimates are based on a payroll survey with a sample of approximately 400,000 establishments and thus roughly one-third of all non-farm payroll employment.<sup>1</sup> Owing to the early publication date, BLS has only between nine and fifteen days to collect and analyse the responses before publishing its first preliminary estimate. Late sample reports lead to revisions to the employment figures in the next two releases. Furthermore, since mid-2003 figures have also been revised on the basis of monthly re-estimates of seasonal factors.

If the absolute over-the-month change in seasonally adjusted employment is considered, ie disregarding the direction of the change, the correction from the first to the third – and final – sample-based estimate amounted to 58,000 persons on average for the period from the start of 1979 to 2010. Compared

with the mean absolute over-the-month change in employment of 206,000 jobs, this revision usually is indeed substantial.

More importantly, the direction of the revision does not appear to be random. Based on the National Bureau of Economic Research's (NBER) dating of business cycles, the monthly drop in employment during periods of recession was corrected upwards by an average of 17,000 job cuts from the first to the final estimate. By contrast, during economic upturns, estimates for employment growth were raised by 18,000 jobs on average. Hence, in general, the first preliminary estimate does not appear to fully reflect cyclical movements in employment.

This distortion has been particularly pronounced in the more recent past. On average, over-the-month job cuts during the 2008-2009 recession were initially understated by 54,000 positions. Conversely, during the ensuing period of recovery, employment growth was adjusted upwards by 40,000 persons on average. According to the first preliminary estimates, a total of only 715,000 jobs were created in net terms during 2010. However, the final estimates indicate a figure of 1.2 million, meaning that 40% (480,000) of the new jobs were "created" as a result of revisions in the months thereafter. Hence, when interpreting current employment figures, foreseeable future revisions should be taken into account.<sup>2</sup>



<sup>1</sup> See BLS, Technical information: Revisions to CES data for late sample reports, annual benchmarking, and other factors, <http://www.bls.gov/ces/cesregrevtec.htm>, as well as BLS, Employment from the BLS household and payroll surveys: summary of recent trends, March 2011, [http://www.bls.gov/web/empsit/ces\\_cps\\_trends.pdf](http://www.bls.gov/web/empsit/ces_cps_trends.pdf). — <sup>2</sup> In addition to late sample reports and concurrent seasonal adjustment, employment estimates also undergo other corrections, in particular

the annual benchmark revision, which is also likely to have been subject to cyclical influences in the past few years. See BLS, Benchmark Article (2009), <http://www.bls.gov/ces/cesb-mart09.pdf>. — <sup>3</sup> Over-the-month change in the number of non-farm payroll employees calculated from the final estimate minus the first estimate. Source: Bureau of Labor Statistics.

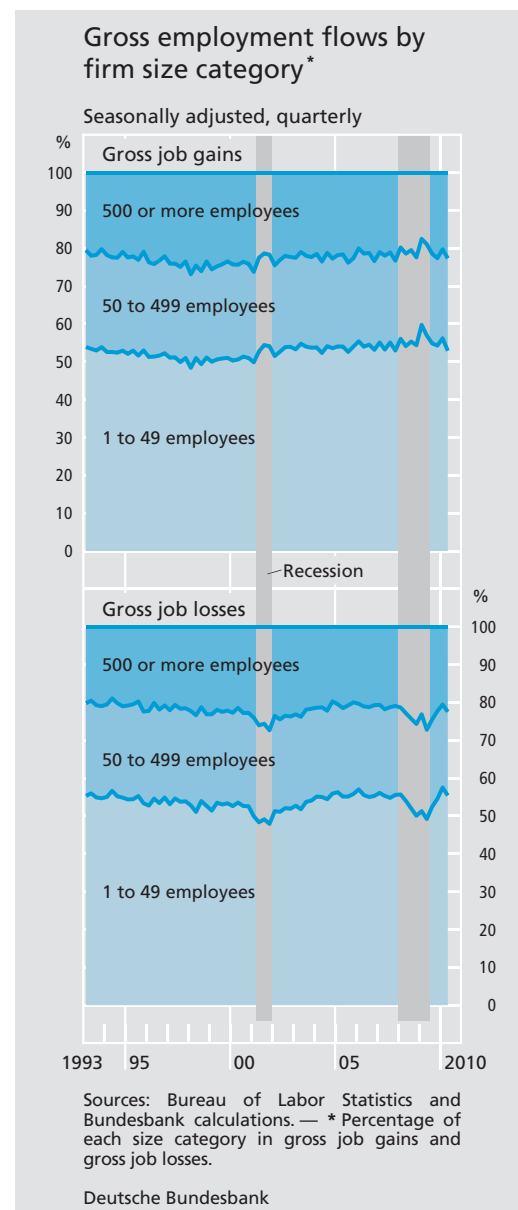


*Following wave of lay-offs, business reluctant to hire, ...*

mated every month by the BLS on the basis of its survey of business establishments, the Current Employment Statistics (CES); (for more details, see box on page 42). This represents only a net figure, however, which results from much larger gross flows. A great deal of modern labour market analysis in the US is devoted to this gross increase and decrease in employment. While the emergence of unemployment in the wake of the recessions in the 1970s and 1980s was due predominantly to large-scale redundancies, the increase in unemployment in the early 1990s and at the beginning of the millennium was caused to a greater extent by enterprises' reluctance to hire. In the recent downturn in overall economic activity, however, large-scale lay-offs initially played a prominent role again. Economists see this as a distinguishing feature between severe and mild recessions.<sup>14</sup> Yet, while the wave of redundancies receded during 2009, the number of hires remained at a very low level.<sup>15</sup>

*... which is often, albeit erroneously, attributed to small enterprises*

One popular explanation is that small enterprises, in particular, are cautious about hiring new staff because they depend on banks for their financing and tighter credit conditions therefore put them at a comparative disadvantage. The only relevant information on this published by the BLS is to be found in the Business Employment Dynamics. The statistics are available only at quarterly frequency and with a considerable time lag but they do contain a breakdown of gross employment flows by firm size. These statistics are compiled principally by analysing the official unemployment insurance records, which at least means that sampling errors can be ruled out. The



data show that, during the recent recession, gross job gains reached a trough in every firm

<sup>14</sup> See M Elsby, B Hobijn and A Sahin (2010), The Labor Market in the Great Recession, Brookings Papers on Economic Activity, Vol 2010, No 1, pp 1-49, and R J Faberman (2010), Hiring, Job Loss, and the Severity of Recessions, Federal Reserve Bank of Philadelphia, Business Review, 2010 Q2, pp 16-24.

<sup>15</sup> See M deWolf and K Klemmer (2010), Job Openings, Hires, and Separations Fall during the Recession, Bureau of Labor Statistics, Monthly Labor Review, May 2010, pp 36-44.

size category.<sup>16,17</sup> In this respect, too, the recent labour market weakness appears to have been exceptionally broadly based. It therefore seems appropriate to see a macroeconomic phenomenon – rather than dislocations between businesses of different sectors, regions or size categories – as being at the root of the problem.

### Wages and profits

*Nominal wages still on an upward trend despite high unemployment and low inflation*

The wage mechanism has an important adjustment function in the labour market. In this context, a high unemployment rate should have a dampening effect on nominal compensation, because, for instance, it weakens the employees' bargaining position. Looking at labour compensation per hour worked in the non-farm business sector, adjusted for the relevant value added deflator, falls in the real wage in the USA, although rare, can indeed be observed. But, especially in the past two years – which were characterised by major underemployment – real labour compensation continued to increase robustly. Given stable prices, wages would have to fall in nominal terms to produce a real decline. In aggregate, however, the national accounts data on cost developments, which include non-wage costs, show that there has been no cut in the nominal hourly wage in the business sector in any year since the statistics were first recorded in 1948. A clear negative correlation between growth in nominal hourly earnings and the unemployment rate can be established for certain periods, particularly from 1993 to 2008.<sup>18</sup> This Phillips curve has flattened out completely over the past two years, however, since the

sharp rise in unemployment failed to prevent further increases in the nominal wage.<sup>19</sup>

In order to investigate the question of whether, and to what extent, downward nominal wage rigidity represented a binding restriction in the last recession, a comparison with the deep macroeconomic downturns of the mid-1970s and the early 1980s would seem appropriate. With a maximum cumulative decline in real GDP of 3¼% and 3% compared with their respective cyclical peaks, these are among the deepest recessions of the post-war period. Nevertheless, they failed to match the severity of the recent one (-4%). Notwithstanding this, in some cases there were considerable losses of real earn-

*Real wage increase in marked contrast to earlier severe recessions*

<sup>16</sup> See J Helfand (2010), All Firm Sizes Hit Hard during the Current Recession, Bureau of Labor Statistics, Issues in Labor Statistics, March 2010.

<sup>17</sup> Looking at the percentage of each firm size category in gross job gains, scarcely any cyclical pattern is apparent. At most, the percentage of small firms (with between one and 49 employees, in line with the classification of the ADP Labour Market Report) increased slightly, in fact, during the recent recession, while, as a mirror image, the percentage of large firms (500 or more employees) showed a marginal fall. In the case of gross job losses, however, the cyclical pattern is much more marked with the percentage of large firms shooting up in the recession.

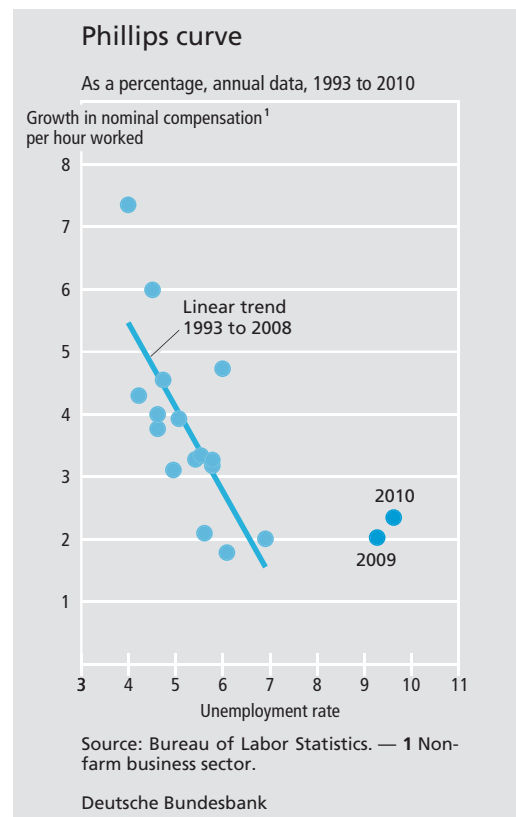
<sup>18</sup> It is acknowledged in the literature that such a correlation is only temporarily stable. In the long term, the Phillips curve is vertical, which means that a given level of underemployment is compatible with any nominal rate of wage growth. See J Galí (2010), The Return of the Wage Phillips Curve, NBER working paper, No 15758.

<sup>19</sup> Besides including non-wage costs, wage data from the national accounts might give a distorted impression owing to differing composition over time. Nevertheless, other measures also confirm downward nominal wage rigidity. In order to eliminate the effect on the observed labour compensation of shifts in employment between occupational groups and industries, the BLS has specifically constructed the survey-based Employment Cost Index (ECI). According to this indicator, year-on-year growth in wages and salaries in the private sector (excluding non-wage costs) fell from +3¼% in the final quarter of 2007 to just +1¼% two years later, with the change remaining positive even in the construction sector. Despite persistently high unemployment, the year-on-year figure had, in fact, gone back up to +1¼% by autumn 2010.

ings, albeit in a strongly inflationary setting, during the course of the recession. This is illustrated by the real hourly earnings of production employees in the private sector, estimated by the BLS on the basis of the monthly Current Employment Statistics (CES) and the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W).<sup>20</sup> Fifteen months after each of the earlier recessions began, real wages had fallen by 4½% in 1974-75 and ½% in 1981-82; in 2008-09, however, they had risen by 4½%.<sup>21</sup> In qualitative terms, the comparison is scarcely any different if other price measures are applied for deflating, especially not if energy and food are excluded from the CPI-W basket of goods.

*Wage costs  
firms' key  
instrument  
of adjustment  
in recessions*

To assess the impact of the differing developments in real wages, the Bureau of Economic Analysis and BLS data on non-financial corporations' value added, costs and employment can be analysed.<sup>22</sup> In a recession, firms attempt to adjust their costs quickly to diminishing sales. As some other costs are essentially fixed in the short term and their share in value added increases accordingly, US enterprises mainly reduce their labour compensation in proportion to their nominal output. While this means that the profit margin shrinks perceptibly owing to the pressure of other costs, the percentage of wage costs in value added is largely constant. In the recovery phase, which is understood below as the first four quarters after the given cyclical trough, the ratio of other costs returns to normal again. The profit margin improves considerably, however, because wage costs also clearly lag behind the expansion in nominal output. The recessions of 1974-75, 1981-82



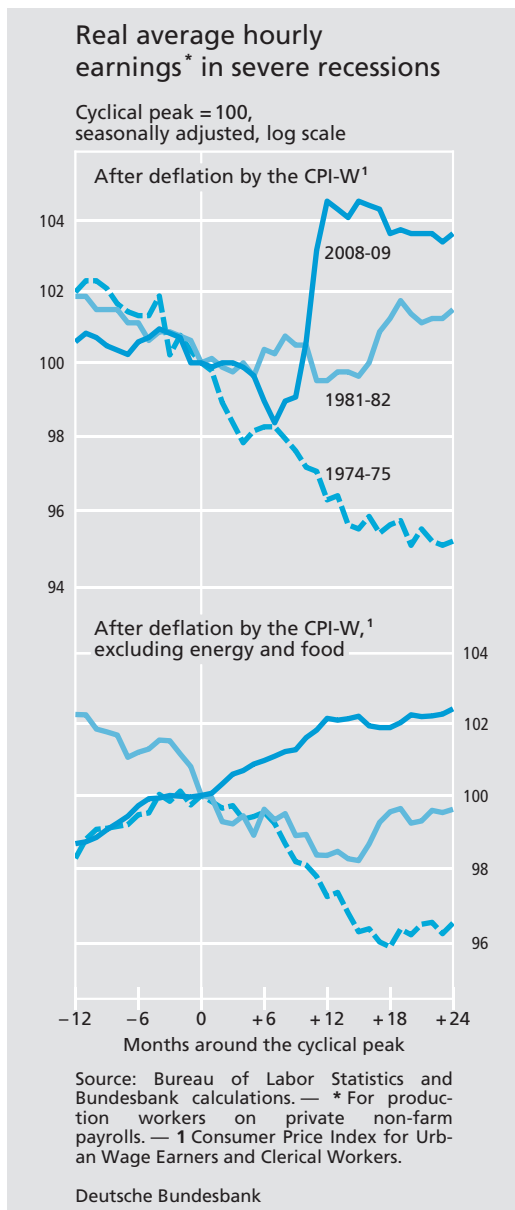
and 2008-09 all follow this typical pattern.<sup>23</sup> In actual fact, the profit and cost components fluctuate to a very similar extent.

<sup>20</sup> Hourly earnings as shown in the CES do not include non-wage costs and irregular bonus payments, but may be influenced by shifts in employment between industries and occupational groups. The ECI time series only goes back to 2001. This indicator is therefore unsuitable for the present historical comparison.

<sup>21</sup> The rather marginal decline in real wages at the beginning of the 1980s should also be seen in the context of the fact that the recession in 1981-82 had already been preceded by a macroeconomic downturn in 1980. By July 1981, the cyclical peak dated by the NBER, the real hourly wage had already declined by 6¼% within the space of two years.

<sup>22</sup> This definition of the business sector has been chosen because the profits of financial corporations were subject to severe special factors particularly in the wake of the recent financial crisis.

<sup>23</sup> In a departure from the NBER dating, the second quarter of 1981 is taken below as a reference point for the 1981-82 recession, since the wage cost component was temporarily exceptionally low in the third quarter of 1981. Furthermore, with July, the cyclical peak was set by the NBER in terms of the month as early as the beginning of summer.



*Increase in real per capita wage costs to the detriment of employment...*

If the same deflators are used as a basis, the share of wage costs in nominal gross value added corresponds to the ratio of real labour compensation to output. Of the three recessions considered here, the most recent one displayed the least favourable pattern of production with the sharpest decline in the downturn and the weakest rise in the recovery. Accordingly, firms initially had to make the deepest cuts in real wage costs, too, and

then curb their upward movement most. To do this, both the number of employees and real wages per employee can be varied. In the mid-1970s, both components made virtually equal contributions not only to the decline in real wage costs in the downturn but also to the increase in the recovery. By contrast, the lowering of real wage costs in the most recent recession was achieved to a very large extent by means of a massive reduction in jobs. Furthermore, the cost surge in the following four quarters – with continuing job cuts – was due solely to a renewed rise in real earnings per employee.

These, in turn, are composed of the real hourly wage and the number of hours worked per employee. The latter are typically cut down temporarily in recessions in order to retain personnel. In this respect, the most recent downswing does not essentially differ from the crisis in the mid-1970s.<sup>24</sup> Nevertheless, real hourly earnings pushed up the share of labour compensation in gross value added by approximately 3 percentage points overall during the last recession and the following four quarters, compared with a contribution of 1½ percentage points between 1981 and 1983 and 1 percentage point between 1974 and 1976. Most of this cost surge arose only in the emergent macroeconomic upturn, however, and was due in roughly equal parts to persistent growth in nominal hourly earnings and the fall in prices. All other things being equal, if the nominal hourly wage had,

*... and of considerable importance in quantitative terms*

<sup>24</sup> Much as in the case of real earnings, the adjustment of hours worked per employee in the 1981-82 recession is also likely to have been “pre-empted” by the immediately preceding downturn.

### Adjustment of labour compensation in severe recessions and subsequent periods of recovery

Change in share of labour compensation in the nominal gross value added of non-financial corporations and calculational contributions of major determinants in percentage points <sup>1</sup>

| Item  | Recessions <sup>2</sup>                |  |  | Periods of recovery <sup>3</sup>       |  |  |
|---|--|--|--|--|--|--|
|   | 2009 Q2<br>compared<br>with 2007<br>Q4 | 1982 Q4<br>compared<br>with 1981<br>Q2 | 1975 Q1<br>compared<br>with 1973<br>Q4 | 2010 Q2<br>compared<br>with 2009<br>Q2 | 1983 Q4<br>compared<br>with 1982<br>Q4 | 1976 Q1<br>compared<br>with 1975<br>Q1 |
| Share of compensation of employees<br><i>of which</i> | 0.5                                    | 0.3                                    | -0.2                                   | -2.0                                   | -1.8                                   | -2.1                                   |
| Real compensation                                     | -5.4                                   | -1.6                                   | -4.7                                   | 2.3                                    | 4.0                                    | 4.2                                    |
| Employees   | -5.0                                   | -2.5                                   | -2.3                                   | -0.9                                   | 2.7                                    | 1.9                                    |
| Real compensation per employee                        | -0.4                                   | 0.9                                    | -2.4                                   | 3.2                                    | 1.3                                    | 2.3                                    |
| Hours per employee                                    | -1.1                                   | -0.2                                   | -1.9                                   | 0.8                                    | 0.8                                    | 0.6                                    |
| Real hourly compensation                              | 0.7                                    | 1.1                                    | -0.6                                   | 2.4                                    | 0.5                                    | 1.7                                    |
| Deflator of value added                               | -1.9                                   | -5.2                                   | -9.1                                   | 1.1                                    | -1.3                                   | -3.2                                   |
| Nominal hourly compensation                           | 2.6                                    | 6.3                                    | 8.5                                    | 1.3                                    | 1.8                                    | 4.9                                    |
| Real value added                                      | 5.9                                    | 1.9                                    | 4.6                                    | -4.3                                   | -5.8                                   | -6.3                                   |

Sources: Bureau of Economic Analysis, Bureau of Labor Statistics, and Bundesbank calculations. — <sup>1</sup> Higher-level contributions may differ from the sum of individual con-

tributions due to rounding. — <sup>2</sup> In departure from the NBER dating, 1981 Q2 instead of Q3 as a reference point. — <sup>3</sup> First four quarters after cyclical trough.

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at least, not risen further since the second quarter of 2009, non-financial corporations, at a rough calculation, would have been able to employ 1½ million more persons one year later. Given unchanged real hourly earnings, the real wage sum would have been sufficient, in purely nominal terms, for 3 million more jobs. If employees' working hours had also been maintained, the number of jobs could have been as much as 4 million higher.

Admittedly, such back-of-the-envelope calculations can provide, at most, a rough guideline for estimating the macroeconomic effects, especially as they leave aside the endogeneity of the variables. Simulations using the NiGEM macroeconomic model, which incorporates such mutual dependencies, make clear, however, that downward nominal

wage rigidities can considerably strengthen the dampening of employment in the United States following a negative demand shock (for more details, see the box on pages 48 and 49).

The adjustment of wage costs by US enterprises over the past years differs not only from earlier periods but also – and even more markedly – from developments in Germany. Using national data as a basis, the BLS compiles an annual dataset comparing manufacturing productivity and labour compensation trends in 19 advanced economies. This shows that, at +5%, there was a similarly sharp rise in (nominal) wage costs per hour worked in Germany in 2009 and in the United States (+5¼%). In Germany, this increase in costs was due essentially to a sharp reduction in the number of

*German enterprises cut per capita wage costs*

## The importance of nominal wage adjustments in NiGEM simulations

The importance of the nominal wage mechanism for absorbing macroeconomic shocks can be demonstrated through simulations using NiGEM, the global macroeconomic model developed by the National Institute of Economic and Social Research. If nominal wages are assumed to be flexible, an abrupt, steep drop in demand leads, in the short term, to a correspondingly sharp slump in overall output.<sup>1,2</sup> However, by the third year, output is almost back at baseline level. Above all, the dampening effect on employment is cushioned to a large extent by nominal wage adjustments. Even the initial job cuts are much smaller than output losses. In the third year, the response actually enters positive territory. Hence the simulation can reflect neither the severity nor the persistence of the slump in employment that was observed in the US in 2008 and 2009. The model also shows a sharp decline in nominal hourly wages vis-à-vis the baseline. Given that wage growth in the base scenario is already muted, this means that nominal hourly wages would fall on the period in the first few years.

Alternatively, it is assumed that nominal wages cannot sink and a drop in demand merely leads to a moderation in wage growth over an extended period of time.<sup>3</sup> As wage growth in the base scenario is already restrained, this means that nominal hourly earnings are only slightly below the baseline and are thus

hardly able to absorb the demand shock. Compared with the scenario where nominal wages are flexible, when downward nominal wage rigidity is assumed the decline in GDP vis-à-vis the baseline is already somewhat larger in the first year and is considerably more persistent in the years that follow. One important point in this context is that private consumption is not the initial driving force. In fact, initial losses in real disposable income and in households' real consumer spending are, at least in the first year, virtually identical in the two simulations. This is mainly due to the differing effects on employment and on employees' nominal average earnings as well as to the sharper fall in prices when wages are flexible. In the medium and longer term, however, the positive employment effect of lower wages on real income and consumption is clearly predominant.

The larger initial collapse in overall output as a result of downward nominal wage rigidity is actually connected with a sharper slump in commercial investment brought about by enterprises' less favourable profit trend. This shortfall is not recuperated in the medium term either. Moreover, enterprises endeavour to rein in costs to a greater extent through job cuts. As a result, the decline in employment is significantly greater than when wages are flexible.<sup>4</sup> Above all, however, job cuts prove to be much more persistent – in line with actual

<sup>1</sup> Specifically, US public consumption is assumed to decline permanently by 5% of GDP. The sole reason for choosing government consumption as the (exogenous) shock variable is to ensure that the conditional equations for the private demand components and their interaction are not affected. However, in qualitative terms, the same effects would

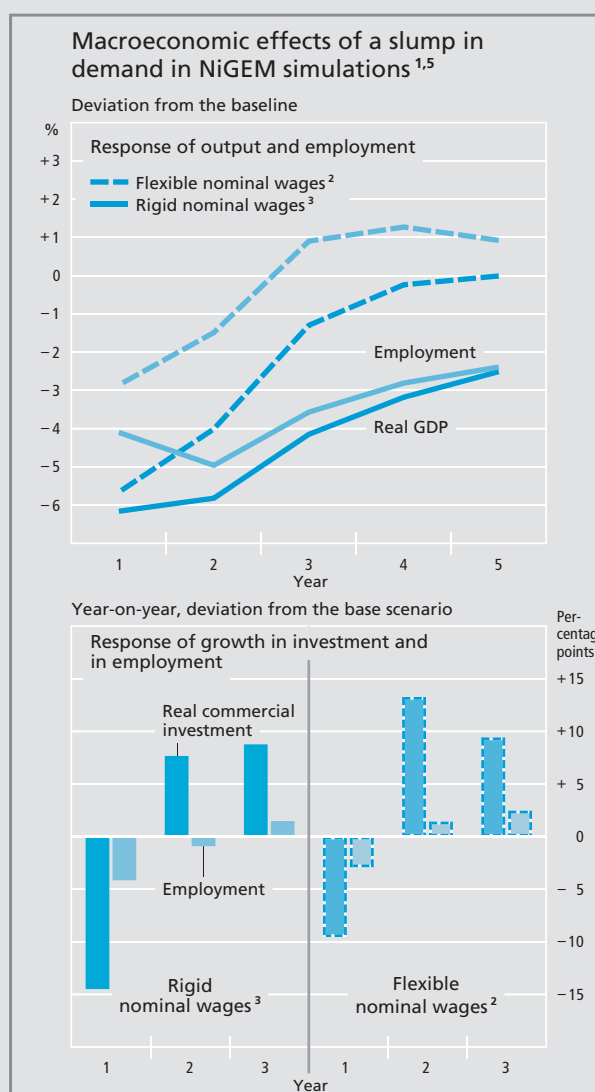
be produced if a private expenditure component were to be shocked (endogenously) instead. To ensure that other important channels by which such a large demand shock could be absorbed are excluded, the nominal key interest rates and exchange rates are fixed. — <sup>2</sup> In this analysis, flexible nominal wages are understood to mean the figures

observations. The distance from the baseline actually increases again in the second year, and employment persists at clearly negative levels even in the fifth year.

It is worth noting that the model simulation with rigid nominal wages shows the (temporary) divergence between investment and employment observed in the US. Looking at the gaps between the year-on-year rates in the simulations and those in the base scenario, investment growth in the second year receives a strong stimulus in both cases – albeit not to the same extent. However, it is only in the simulation where nominal wages are flexible that the surge in investment in the second year is also accompanied by an increase in the number of jobs created. By contrast, rigid wages considerably delay labour market recovery.

Overall, assuming downward nominal wage rigidity allows the distinguishing features of recent employment developments in the US to be reflected in the model simulation. It should be remembered that the extent of these effects is not solely dependent on the size of the assumed demand shock. By assuming a lower bound for nominal wage growth, wage developments in the base scenario also become more important.

calculated endogenously according to the theoretically founded and empirically estimated structural equation implemented in the model, which has no lower bound for growth. — 3 Nominal hourly wages are assumed to increase by 1½% on the previous period in the first year as well as by 1¾% in both the second and the third year. Wage growth



subsequently continues to rise until it is back at the base scenario rate in the seventh year. — 4 In the case of rigid nominal wages, the model already accounts for a slightly greater – but still small – reduction in the number of hours worked per employee. — 5 Figures refer to the US.

hours worked per employee (-7¼%) with only a partial cut in wages. By contrast, the average number of hours worked per employee in manufacturing in the US was reduced by no more than 1¾%. As a result, *per capita* wage costs in the United States in 2009 rose, at +3¼% on the year, just as sharply as on an average of the period 2005 to 2008, while they were reduced by 2½% in Germany, compared with growth of 1¾% on an average of the four preceding years.

*Impact of nominal wage cuts on employee morale*

On the whole, the macroeconomic data indicate considerable downward nominal wage rigidity in the United States. Given an initial situation of price stability, such rigidity may have played a much more important role in the most recent cycle than in earlier business cycles when the US economy entered a difficult economic period coming from an inflationary setting. According to studies based on micro data, downward nominal wage rigidity is especially marked in the United States.<sup>25</sup> A whole series of factors have been discussed in the literature to explain such rigidities. Institutional obstacles, which may be significant in other countries, are hardly likely to stand in the way of wage cuts in the US.<sup>26</sup> Instead, the literature focuses more on psychological and sociological factors. Bewley (1999), for example, advances the theory, based on detailed surveys, that employers fear the possibility of morale and, by extension, productivity suffering seriously from pay cuts since these are perceived to be unjust or even a hostile act.<sup>27,28</sup> By contrast, lay-offs in the wake of a decline in sales are not felt to be unfair and only impair the morale of those affected and not that of the remaining per-

sonnel.<sup>29</sup> In the absence of a cooperative solution, the employer must assume that employees' productivity falls in the event of wage cuts. Consequently, the employer reduces the workforce, thereby making a decision which he sees as rational, but which contributes to even greater losses of demand in macroeconomic terms than if nominal wages were cut.

The problem is different for the employer in Germany. Even with regard to the trade-off between wage cuts and lay-offs, German employees might come to different conclusions about what is fair than their counterparts in the United States. Above all, however, owing to the important role played by labour unions and works councils, German firms tend more to have a cooperative solution available to them in committing the workforce to at least partially sacrificing wages, while maintaining

*Greater cooperation between employers and employees in Germany*

<sup>25</sup> See W T Dickens, L Goette, E L Goshen, S Holden, J Messina, M E Schweitzer, J Turunen and M E Ward (2007), How Wages Change: Micro Evidence from the International Wage Flexibility Project, *Journal of Economic Perspectives*, Vol 21, No 2, pp 195-214, and European Central Bank, *Wage Dynamics in Europe – Final Report of the Wage Dynamics Network (WDN)*, December 2009.

<sup>26</sup> As shown in a recent study by the Congressional Budget Office (CBO), the hourly wage of low earners over the past years has been considerably above the national minimum wage, which means that the latter has probably had little perceptible impact. See Congressional Budget Office, *Changes in the Distribution of Workers' Hourly Wages Between 1979 and 2009*, CBO Study, February 2011.

<sup>27</sup> Unlike nominal wage cuts, reductions in real wages due to the erosion of price stability occur only gradually and are not blamed to the same extent on the employer.

<sup>28</sup> More generally, efficiency wage theories postulate, on the basis of various considerations, that there is a correlation between productivity and remuneration and attempt to explain why enterprises voluntarily forgo wage cuts. See G A. Akerlof and J L Yellen (eds, 1986), *Efficiency Wage Models of the Labor Market*, Cambridge University Press, Cambridge.

<sup>29</sup> See T F Bewley (1999), *Why Wages Don't Fall During a Recession*, Harvard University Press, Cambridge, Massachusetts.



productivity. Moreover, in an economy that is specialised in exporting technologically high-quality goods, retaining firm-specific expertise becomes a more important factor in an economic crisis. Furthermore, redundancies involve higher costs in Germany, and enterprises are prepared to bear a contraction in profits for a time owing to the favourable initial situation and the expected temporary nature of the decline in demand. This temporary acceptance of considerably lower profitability, along with job guarantees, may have made it easier for firms to ask their employees to forgo wages in return. Government assistance for short-time working, which is often cited as a driving factor, provided flank-

ing support to this solution, as did top-up benefits from crisis funds.<sup>30</sup> All things considered, precisely the lack of firmly anchored employee institutions as well as the high degree of labour market flexibility with regard to lay-offs may therefore, to some extent, explain the nominal wage rigidity and unfavourable employment performance in the US compared with Germany over the past few years.<sup>31</sup>

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<sup>30</sup> See Deutsche Bundesbank, Germany in the financial and economic crisis, Labour market, Monthly Report, October 2010, pp 55-69.

<sup>31</sup> See Deutsche Bundesbank, Wage setting in Germany – new empirical findings, Monthly Report, April 2009, pp 17-29.