The German Labour Market Puzzle in the Great Recession

“CEPREMAP Productivity Project“

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Abstract

We investigate the reasons for Germany's job miracle in the Great Recession 2008/2009 with special reference to productivity and employment development. Germany has an extensive system of industrial relations and a strong social partnership. This characteristic makes it possible for German establishments to take advantage of several institutional settings, i.e. short-time work, working time accounts and company-level pacts for employment and competitiveness, in order to overcome the repercussions of economic crises. During the Great Recession specifically, the social partners' willingness to cooperate made a distinct difference for German establishments, thereby saving jobs and retaining establishment competitiveness in the longer run. We show that pacts for employment and competitiveness may not have a great impact in normal times, but significantly affected employment during the 2008/2009 crisis, thus contributing to Germany's successful handling of the crisis.

Keywords: Great Recession, company-level pacts for employment and competitiveness, decentralization of wage setting, labour productivity, employment effects, heterogeneous firms

Content

1. Summary

- Previous economic downturns followed a distinct pattern in Germany. Typically the employment path mirrored changes in the gross domestic product (GDP) with a delay. This pattern was broken in the Great Recession of 2008/2009. While GDP fell severely in 2008, seasonally-adjusted unemployment remained stable. Thus, this chapter investigates potential reasons for this pattern break.
- Germany's GDP declined 6.6 percent from its peak in the first quarter of 2008 (Burda & Hunt, 2011). Compared to other industrialised economies, this decline was one of the most severe of this recession. However, productivity sprung back relatively quickly after the downturn.
- While Germany's employment remained comparatively stable, the average hours worked fell and in conjunction with the last point thereby indicating a reduction of labour productivity. Thus, German firms reacted by adjusting on the intensive margin rather than the extensive margin.
- Not every sector was hit equally by the economic downswing. Though the 2008/2009 recession mainly affected the manufacturing and export-oriented sectors, there were few spill-over effects to more consumer-oriented services. Consequently, the manufacturing sector also suffered the highest employment losses, as well as a severe decline in hours worked, indicating that the reduction in labour productivity was most pronounced in this sector.
- The term "Germany's job miracle", coined by Paul Krugman, illustrates the exceptional resilience of the German labour market in the face of the crisis. The reason for the miracle can be seen in the interaction of several factors. First, Germany experienced favourable conditions prior to the crisis. These conditions include wage and employment moderation in pre-crisis times in combination with a pre-crisis upswing. Additionally, the Hartz reforms restructured the labour market thereby facilitating flexibility. During the crisis, efficient government interventions helped strengthen the German economy. Finally, within-firm flexibilities allowed reasonable employment adjustments.
- Overall, it can be suggested that labour hoarding contributed to the resilience of the labour market. One possible reason explaining the extent of labour hoarding in Germany

may be the perceived shortage of skilled workers and the establishments' inclination to hold on to (highly) qualified employees.

- It can be argued that it was mainly the cooperation of firms, social partners, works councils and individual employees which made the exploitation of within-firm flexibilities possible. German firms could make use of schemes such as short-time work, working time accounts and most opening clauses including company-level pacts for competitiveness and employment. These schemes cumulated into relative employment stability coupled with low labour productivity.
- Germany's dual system of industry-level and establishment-level collective bargaining has previously been critiqued as inflexible. However, the introduction of opening clauses allows the departure from collective agreements at the establishment-level in case of hardship. As major example for opening clauses, pacts for employment and competitiveness should be mentioned in which both the employee and the employer agree to concessions with the goal that the firm remain competitive.
- To investigate the effects of the Great Recession observed on the macro-economic level, micro-economic analyses are conducted with the IAB Establishment Panel Survey. This survey of Germany's labour demand represents all industries and establishment sizes. The data is suited for the analysis of productivity and employment, as the questionnaire consists of annually surveyed questions concerning business development, personnel structure, investments and bargaining arrangements. Furthermore, specific subjects are included at certain intervals, such as the use of short-time work or pacts for employment.
- Results of the micro-economic analyses indicate that labour productivity is subject to rather large fluctuations over the business cycle. This is due to the fact that establishments adjust their employment under-proportionally to changes in the generated value added. This is especially true during the Great Recession.
- Specific to Germany is the existence of institutions that automatically take effect during a crisis, such as for example short-time work, working time accounts and notably pacts for employment and competitiveness. This means that establishments have several possibilities to limit the repercussions of a crisis.
- We focus on the institution of establishment-level pacts. There is evidence that these pacts allowed German establishments to optimally use all measures available to efficiently overcome the crisis with few employment losses and a quick recovery.

2. Introduction

The repercussions of the Great Recession of 2008/2009 have been discussed diligently in the past years and have renewed the focus on the question of nations' productivity development. While substantial inequalities in the level, as well as the development, of productivity in European Union countries were observable before the recession, these differences have manifested more severely during and after the economic crisis of 2008/2009 (see table 1). In order to be able to explain the observed cross-country productivity disparities, in depth analyses of their determinants as well as the particularities of these countries are required.

This chapter's focus lies on Germany's growth paths before, during and since the Great Recession. Compared to other European countries, Germany has dealt surprisingly well with a severe decline in its GDP in 2008/2009 (see table 1). While the country's productivity visibly suffered a substantial shock, employment reactions were comparably mild (see figure 3). Paul Krugman (2009) termed this phenomena "Germany's job miracle" and highlights the exceptional stability of Germany's labour market. Exceptional specifically when comparing Germany's employment patterns to those of other European Union countries, some of whom have still not quite recovered from high unemployment rates incurred during the recession. In addition to Germany's job miracle, productivity sprung back relatively quickly after the downturn, which may be partly due to the rather stable labour market.

As this pattern is unusual for Germany's reaction to economic downturns, the particularities of the recession of 2008/2009 will be discussed in more detail in the following sections. We believe that a driving force behind the specific patterns in productivity and employment development is the system of industrial relations in Germany and the social partner's willingness to cooperate in a time of economic hardship. Thus, this system will be put forth as main reason for Germany's reactions to the crisis with an emphasis on the institution of company-level pacts for employment and competitiveness. Finally, conclusions will be drawn from the analyses with reference to "lessons learned" in order to be able to cautiously suggest best practices[1] for the future.

This chapter first aims to highlight Germany's particular productivity development paths in a short macro-economic overview. Next, reasons for Germany's reaction to the economic re-

[1] It has to be kept in mind though that the initial starting point of the recession hit Germany at a particular point in time and that best practices might not be generally transferable.

cession and its particular development patterns will be highlighted. Germany's "jobs miracle" will be discussed in this context, thereby putting a specific focus on the relation of productivity development and employment development. Furthermore, believing that the specific institutional setting of Germany's labour market, which is characterized by a strong social partnership, has helped Germany deal efficiently with the Great Recession, the chapter's main emphasis lies on Germany's industrial relations. The institutional setup of these unique industrial relations will be described and their effects on employment and productivity will be investigated empirically using the IAB - Establishment Panel Survey. Results will be discussed in detail. A final section concludes and puts forth potential lessons learned from the 2008/2009 recession.

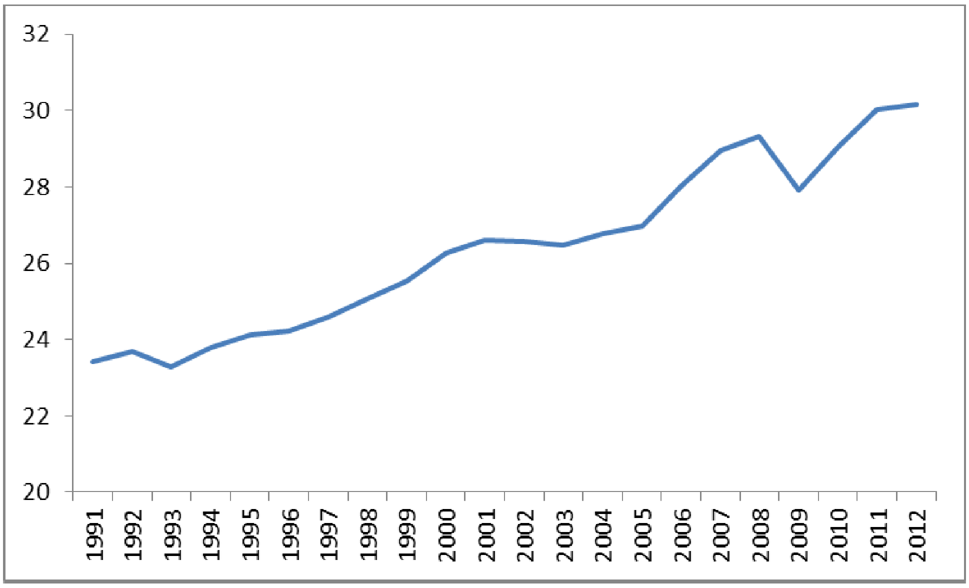
3. Macro-economic trends

At a first glance, it seems difficult to reconcile the fact that Germany was hit comparably hard by the Great Recession but sprang back quickly and strongly. It could have been expected that a severe decline in GDP during 2008/2009 would have lasting repercussions for Germany's economy – as can be observed in several other European countries. However, regarding the macro-economic evidence, this is not the case. Therefore, it is important to examine Germany's productivity and employment development before the Great Recession of 2008/2009 in order to understand the particularities of the developments during, as well as after the downturn.

3.1 GDP and employment developments

A first look at Germany's GDP per head from 1991-2012 (see figure 1) indicates a rather stable pattern. Germany's GDP per head rose more or less steadily from the 1990s to the 2000s. It is notable, that an upswing could be observed right before the Great Recession 2008/2009. When the recession did hit, Germany's per head GDP severely dropped. However, this decline was only of short duration as can be seen by the fact that the GDP rebounded quickly to pre-recession levels (and even surpassed them as soon as 2011).

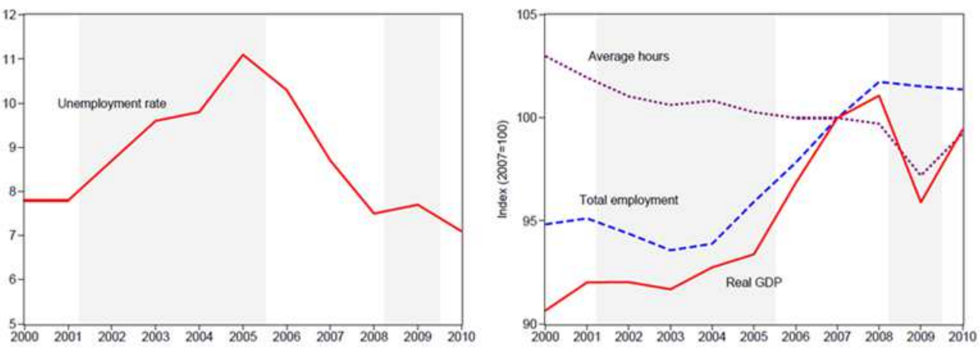
Figure 1: Germany's GDP per head (1991-2012)



Notes: Prices from 2005 in 1000 Euro.
Source: Statistisches Bundesamt (2014).

As these post-recession trends are dissimilar to other European countries' development paths (see chapter 1), a closer look seems necessary in order to understand the particularities of Germany's productivity development. Figure 2 illustrates developments of different economic indicators from 2000 to 2010. The right-hand panel puts real GDP, total employment and average hours worked into relation and the left-hand panel shows the unemployment rate between 2000 and 2010. As was already indicated in the overview given by figure 1, Germany experienced an economic upswing prior to 2008/2009. During this upswing, the unemployment rate declined visibly. With the onset of the recession, real GDP fell substantially. According to Burda and Hunt's (2011) calculations, the GDP declined 6.6 percent from its peak in the first quarter of 2008. Compared to other European Union countries and even among all industrialised economies, this decline was one of the more severe of this recession.

Figure 2: GDP, unemployment rate and average hours worked (2000-2010)



Notes: German unemployment rate, real GDP, total employment and average hours 2000-2010. GDP, employment and hours indexed 2007=100. Source: OECD StatExtracts. Recession dates indicated by shaded areas are those used by Burda & Hunt (2011).
Source: Bellmann et al. (2012).

Table 1 displays GDP growth relative to the previous year for selected countries. According to Eurostat (2014b) calculations, Germany's GDP declined 5.1 percent in 2009 relative to 2008. Comparing this number to that of for example the US GDP, which fell by 2.8 percent in 2009 relative to 2008, or the decline in France (-3.1 in 2009 relative to 2008), Great Britain (-5.2 in 2009 relative to 2008) and Spain (3.8 in 2009 relative to 2008), the extent to which Germany's GDP was hit is put in relation. However, in contrast to the aforementioned countries, the unusually severe decline in GDP was coupled with a surprisingly moderate employment response. More specifically, the unemployment rate increased only marginally and is still lower in 2008/2009 than at the end of the last downturn in 2005 (see figures 2 and 3). This remarkable resilience of the German labour market is coined as "Germany's Job Miracle" (see section 4).

Especially when comparing Germany's quarterly unemployment rates from 2006 to 2013, it becomes apparent how well the German labour market has recuperated in face of the crisis (see figure 3): According to Eurostat (2014a), Germany's unemployment rate started out at 10.6 percent in 2006Q1 and steadily declined prior to the crisis[2] to 7.2 percent in 2008Q4. Even during 2009Q4, Germany's unemployment rate remained at 7.7 percent (compared to Spain 2009Q4: 18.9 percent; France 2009Q4: 9.6 percent; UK 2009Q4: 7.7 percent; USA:

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[2] A possible reason for this steady decline are labour market reforms undertaken in the 2000s (see section 4.2).

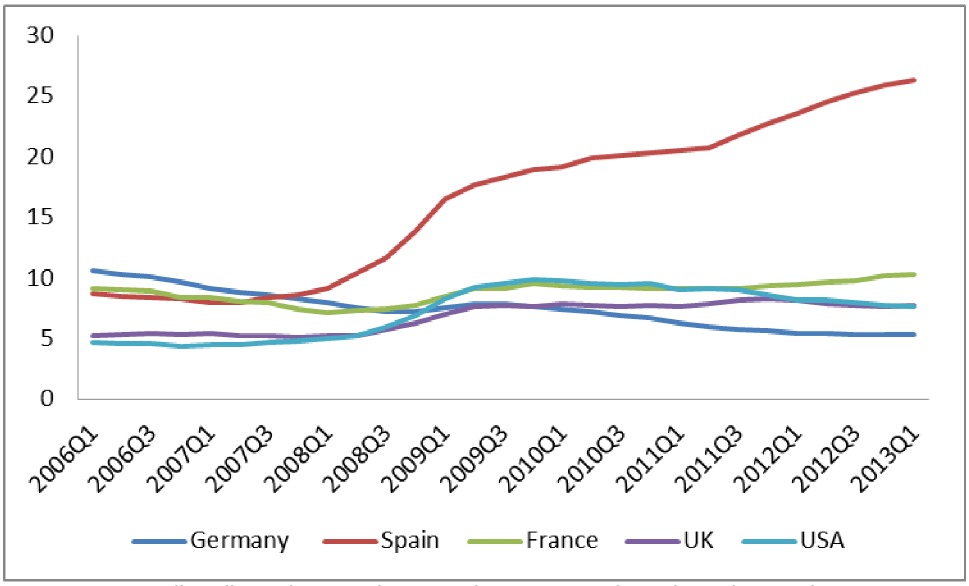
9.9 percent). In 2013Q4 the seasonally-adjusted unemployment rate was one of the lowest in Europe with 5.2 percent. These numbers additionally suggest a strong labour market even during crisis times.

Table 1: Growth rate of real GDP in selected countries

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
EU (28 countries)	1,3	1,5	2,6	2,2	3,4	3,2	0,4	-4,5	2	1,6	-0,4	0,1
EU (17 countries)	0,9	0,7	2,2	1,7	3,3	3	0,4	-4,4	2	1,6	-0,7	-0,4
Belgium	1,4	0,8	3,3	1,8	2,7	2,9	1	-2,8	2,3	1,8	-0,1	0,2
Bulgaria	4,7	5,5	6,7	6,4	6,5	6,4	6,2	-5,5	0,4	1,8	0,6	0,9
Tschech Rublic	2,1	3,8	4,7	6,8	7	5,7	3,1	-4,5	2,5	1,8	-1	-0,9
Denmark	0,5	0,4	2,3	2,4	3,4	1,6	-0,8	-5,7	1,4	1,1	-0,4	0,4
Germany	**0**	**-0,4**	**1,2**	**0,7**	**3,7**	**3,3**	**1,1**	**-5,1**	**4**	**3,3**	**0,7**	**0,4**
Ireland	5,4	3,7	4,2	6,1	5,5	5	-2,2	-6,4	-1,1	2,2	0,2	-0,3
Greece	3,4	5,9	4,4	2,3	5,5	3,5	-0,2	-3,1	-4,9	-7,1	-7	-3,9
Spain	2,7	3,1	3,3	3,6	4,1	3,5	0,9	-3,8	-0,2	0,1	-1,6	-1,2
France	0,9	0,9	2,5	1,8	2,5	2,3	-0,1	-3,1	1,7	2	0	0,2
Croatia	4,9	5,4	4,1	4,3	4,9	5,1	2,1	-6,9	-2,3	-0,2	-1,9	-1
Italy	0,5	0	1,7	0,9	2,2	1,7	-1,2	-5,5	1,7	0,4	-2,4	-1,9
Luxemburg	4,1	1,7	4,4	5,3	4,9	6,6	-0,7	-5,6	3,1	1,9	-0,2	2,1
Hungary	4,5	3,9	4,8	4	3,9	0,1	0,9	-6,8	1,1	1,6	-1,7	1,1
Netherlands	0,1	0,3	2,2	2	3,4	3,9	1,8	-3,7	1,5	0,9	-1,2	-0,8
Austria	1,7	0,9	2,6	2,4	3,7	3,7	1,4	-3,8	1,8	2,8	0,9	0,4
Poland	1,4	3,9	5,3	3,6	6,2	6,8	5,1	1,6	3,9	4,5	2	1,6
Portugal	0,8	-0,9	1,6	0,8	1,4	2,4	0	-2,9	1,9	-1,3	-3,2	-1,4
Rumania	5,1	5,2	8,5	4,2	7,9	6,3	7,3	-6,6	-1,1	2,3	0,6	3,5
Slowenia	3,8	2,9	4,4	4	5,8	7	3,4	-7,9	1,3	0,7	-2,5	-1,1
Finnland	1,8	2	4,1	2,9	4,4	5,3	0,3	-8,5	3,4	2,8	-1	-1,4
Sweden	2,5	2,3	4,2	3,2	4,3	3,3	-0,6	-5	6,6	2,9	0,9	1,6
Great Britain	2,3	3,9	3,2	3,2	2,8	3,4	-0,8	-5,2	1,7	1,1	0,3	1,7
Island	0,1	2,4	7,8	7,2	4,7	6	1,2	-6,6	-4,1	2,7	1,5	3,3
Norway	1,5	1	4	2,6	2,3	2,7	0,1	-1,6	0,5	1,3	2,9	0,6
Switzerland	0,2	0	2,4	2,7	3,8	3,8	2,2	-1,9	3	1,8	1	2
USA	1,8	2,8	3,8	3,4	2,7	1,8	-0,3	-2,8	2,5	1,8	2,8	1,9
Japan	0,3	1,7	2,4	1,3	1,7	2,2	-1	-5,5	4,7	-0,5	1,4	1,6

Notes: Changes relative to the previous year in percent.
Source: Eurostat (2014b).

Figure 3: Quarterly unemployment rate (2006-2013)



Notes: Seasonally adjusted quarterly unemployment rate for selected countries.
Source: Eurostat (2014a).

Another important characteristic of Germany's economic reaction to the recession is that while employment remained relatively stable, the average hours worked fell, indicating a reduction of labour productivity[3].

Labour productivity, labour costs and unit labour costs are an important indicator of a nation's competitiveness. Specifically during the Great Recession, these key figures can be an important indication of longer term development.

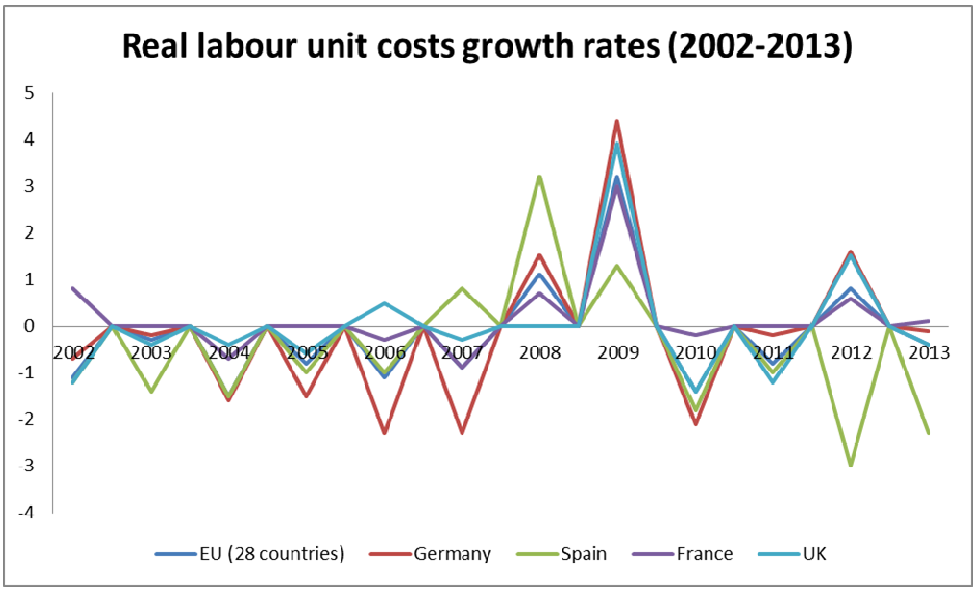
Looking at a longer trend, Germany's labour productivity, defined as the ratio of GDP to worker (employed and self-employed) or GDP to hours worked has risen by 22.7 percent between 1991 and 2011 and by 34.8 percent respectively (Destatis, 2012). Thus, during this period, labour productivity (per hour) developed positively. Labour costs (per worker) increased by 47.5 percent in the same period, while the average hours worked decreased by almost 10 percent during this time. The unit labour costs increased by 20.2 percent (per worker). The main portion of this growth can be attributed to the five years after Germany's reunification; afterwards the unit labour costs remained relatively stable until 2008 with an

[3] This reduction in labour productivity is in stark contrast to the US' markets reaction to the crisis. As Ohanian (2010) points out, the effects of the recession on the US differs from Germany, France and the UK in so far as lower output was due to a large reduction of labour inputs in the US as opposed to a decrease in labour productivity.

average yearly increase of less than one percent - only to increase substantially in 2009 by 5.5 percent per worker and respectively by 6.0 percent per hour relative to the previous year (Destatis, 2012; Hauf, 2012). Thus, while employment remained stable and productivity plummeted, labour unit costs rose. In 2010, a unit labour costs alignment occurred (-1.2 percent and – 1.5 percent respectively), however, in 2011 a renewed increase could be observed (-1.4 percent and 1.2 percent respectively) (Hauf, 2012). The reason for these increasing unit labour costs are stabilizing measures taken to overcome the Great Recession.

More meaningful is the comparison with other EU countries. Figure 4 shows the labour costs in relation to GDP and the depicted growth rates indicate the development of the share of the production input labour to the value added. The take-away point of this figure is that Spain's pattern deviates greatly from that of Germany, France and the UK. For Germany, the initial alignment of 2009 reversed back to rising labour unit costs in the following years.

Figure 4: Labour unit costs growth rate

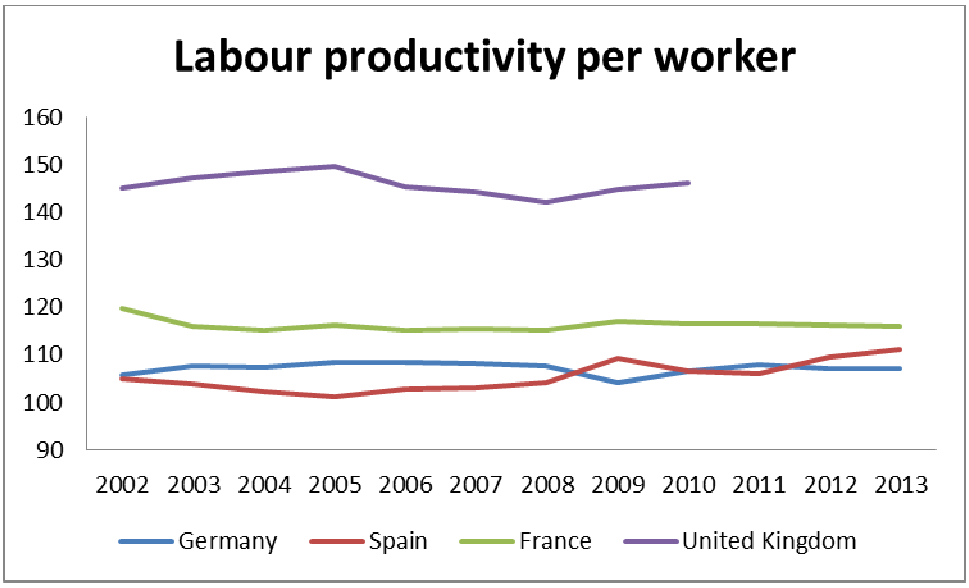


Source: Eurostat (2014c).

Figure 5 shows the labour productivity per worker and figure 6 shows the labour productivity per hour worked (both indexed to EU 27 countries = 100). Labour productivity per worker and respectively per hour worked above 100 indicates that the country's labour productivity lies over the EU 27 average.

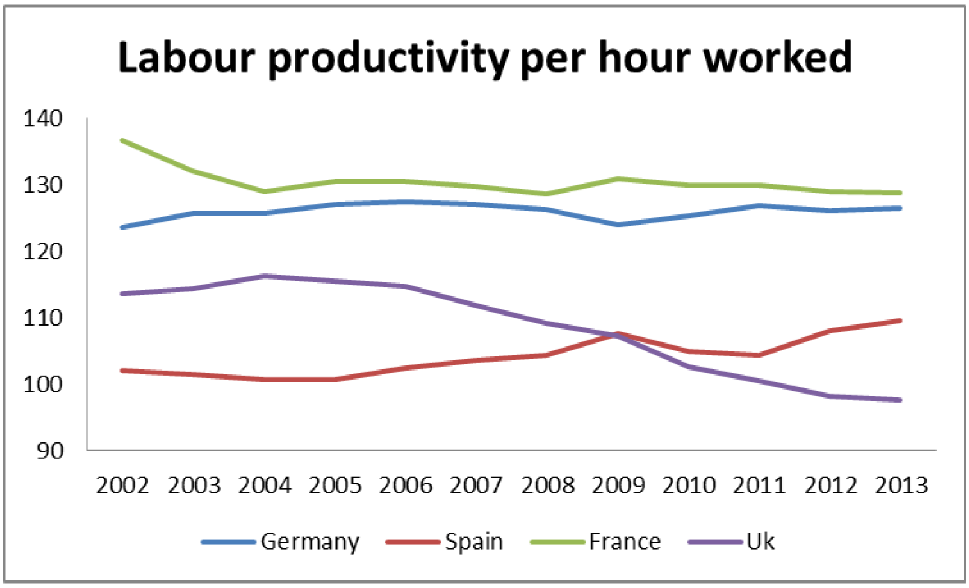
These figures reveal the specificity of Germany during the Great Recession. While labour productivity did experience a short downward turn in 2009, it rebounded quickly and is currently on an upward trajectory, which clearly distinguishes the German case from that of the other three countries, where we do not see the dip in 2009 and ensuing increase in labour productivity. This is particularly interesting as the UK case for example is rather similar to the German case insofar as the UK also experienced favorable pre-crisis conditions and the hoarding of high skilled labour was equally important (see chapter on UK).

Figure 5: Labour productivity per worker



Source: Eurostat (2014d).

Figure 6: Labour productivity per hour worked



Source: Eurostat (2014e).

Thus, as first take-away, German firms reacted by adjusting the intensive margin (hours worked), rather than the extensive margin (number of employees), thereby keeping total employment stable during the downturn. Possible reasons for this reaction will be discussed in the next section.

3.2 Future outlook

Recent prognoses of the IAB anticipate Germany's growth development to pick up speed (Fuchs et al., 2014). For 2014 the real GDP is expected to grow by 2 percent. Unemployment should decline by 70.000 people to 2.88 million. These positive expectations indicate that Germany not only faced the recession with resilience but was additionally able to pick up GDP growth and further keep unemployment on low levels in the years following the crisis, albeit allowing for a couple of years of slower progress (see table 1) due to the development of the world economy (Fuchs et al., 2014).

The prognosis[4] for 2015 is good, as a continued upswing for 2015 is expected (Wollmershäuser et al., 2014). The gross domestic product is projected to grow 2.2 percent. While the export volume is growing following the improved situation of the world market, most of the GDP growth is predicted to result from the growth of the domestic economy. This is due to, for example, the production at capacity which induces acquisition and expansion investments, as well as investments in construction. Additionally imports are expected to grow to support the domestic economy's dynamics. While the labour market is stable and unemployment rates are low (Klinger, Weber, 2014), current risks include the implementation of a minimum wage and changes in the pension age ("abschlagsfreie Rente mit 63" – reduction free pension at 63) (Wollmershäuser et al., 2014). Nevertheless, a positive trend is also expected for the labour market. Thus, overall, Germany will continue with a steady - albeit not large – upward trend.

An important point to be made in this context concerns the long-term repercussions of the Great Recession. Ball (2014) assess these long-term effects for different OECD countries by comparing the current estimates of potential output to the path that output potential was following prior to the crisis. The estimates are based on data from the OECD Outlook for May

[4] The prognosis will be dependent on geopolitical risks concerning the Ukraine and Iraq.

2014 and for 2007 (for the pre-crisis paths) respectively. The losses in potential output[5] are country-specific and range from zero percent for Switzerland to more than thirty percent for Greece, Hungary and Ireland. The average loss is 8.4 percent. Compared to the other 23 countries in the study, Germany comes in third after Switzerland and Australia[6] with a loss of in potential in 2013 of 2.87 percent and 3.39 percent in 2015. The difference in the growth rate of potential for Germany is also small with a pre-crisis growth rate estimation of 1.52 percent and a 2014-2015 estimation of 1.2 percent. Thus, one can conclude that the hysteresis effect of the Great Recession for Germany is minimal and more specifically, that no hysteresis effect can be seen for the labour market. Especially compared to the other countries in this study, this is a remarkable observation[7].

3.3 Establishment-level trends

Similar patterns as above emerge when looking at data from the IAB-Establishment Panel [illegible] IAB-Establishment Panel Survey corroborates that employment grew slowly prior to the crisis and peaked during the upswing just before the Great Recession (panel a). However, employment declined only moderately as a response to the economic downturn. This is specifically surprising when regarding panel b which depicts the sales growth in the same period. It is clear from the figure that sales plummeted substantially with the onset of the crisis and did not recover as quickly as employment growth (at least concerning the balanced panel from 2000-2010). The increasing sales shown by the balanced panel (2000-2012) of figure 7 panel b indicates that the crisis was only a temporary shock (and increasing sales could possibly be attributed to exports to Asia, see section 4). The two panels c and d of figure 7 additionally show the separation and layoff rates on the establishment-level and furthermore highlight the mild response and the relative stability of the labour market during the economic downturn.

Figure 7: Employment Growth, Sales Growth, Separation Rate and Layoff Rate

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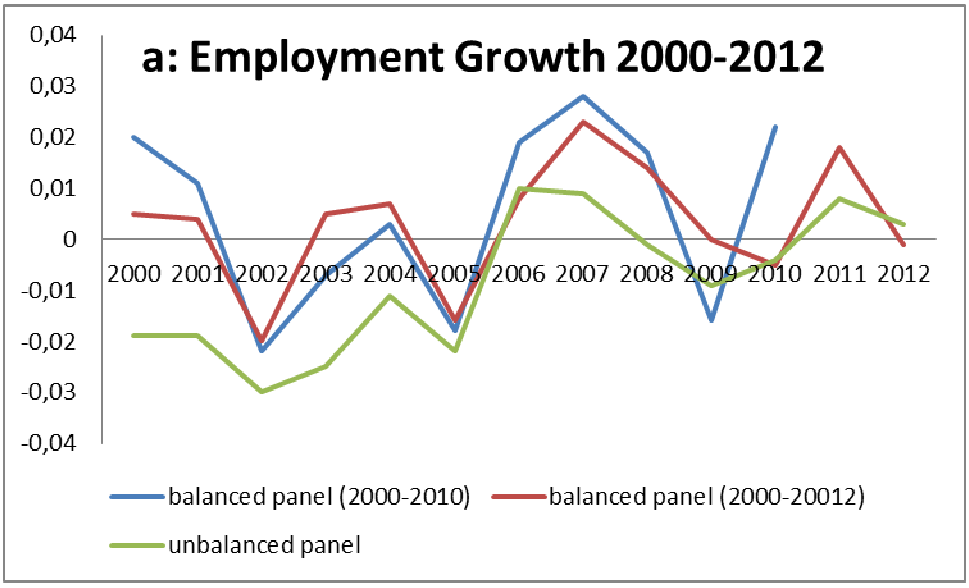
[5] The loss in potential output is computed as the potential output prognosis estimated by the OECD in 2007 (Y**) in relation to the potential outcome prognosis estimated in 2014 (Y*): (Y**-Y*)/Y**.

[6] Australia is assumed to have dealt well with the crisis due to fiscal stimulus and exports to Asia (Ball, 2014).

[7] To highlight this statement it is useful to compare Germany's estimates to those of other OECD countries. Thus, the loss of potential in 2013 is 4.7 percent (5.33 percent for 2015) for the USA, 10.98 percent (12.37 percent for 2015) for Great Britain, 7.5 percent (8.58 percent in 2015) for France and 18.21 percent (22.33 percent in 2015) for Spain.


a: Employment Growth 2000-2012
0,04
0,03
0,02
0,01
0
-0,01
-0,02
-0,03
-0,04
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
balanced panel (2000-2010)
balanced panel (2000-20012)
unbalanced panel

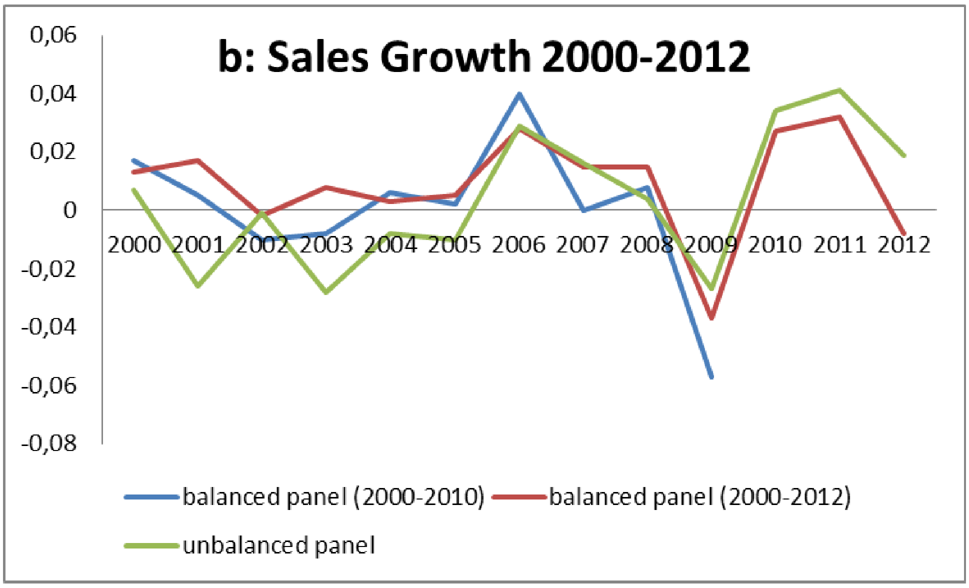
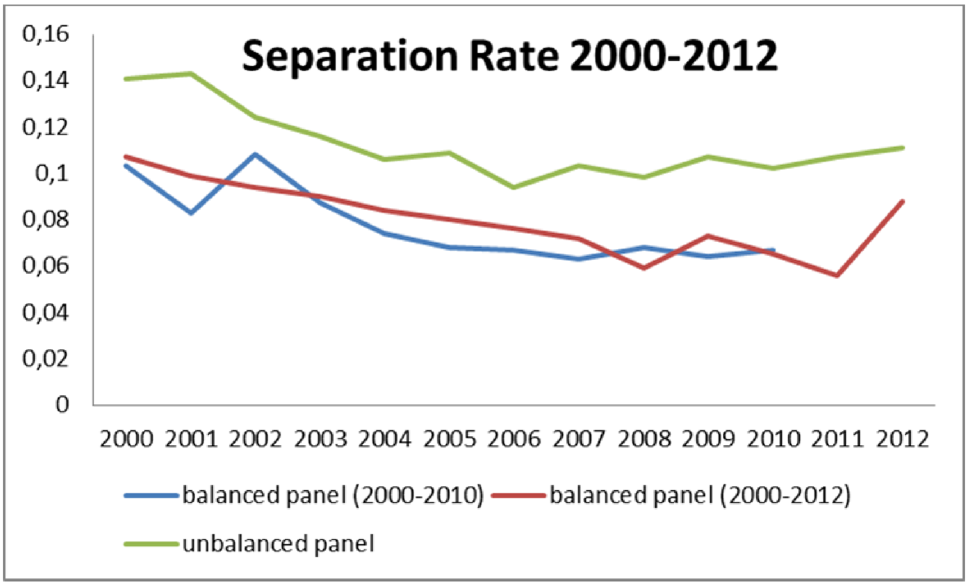
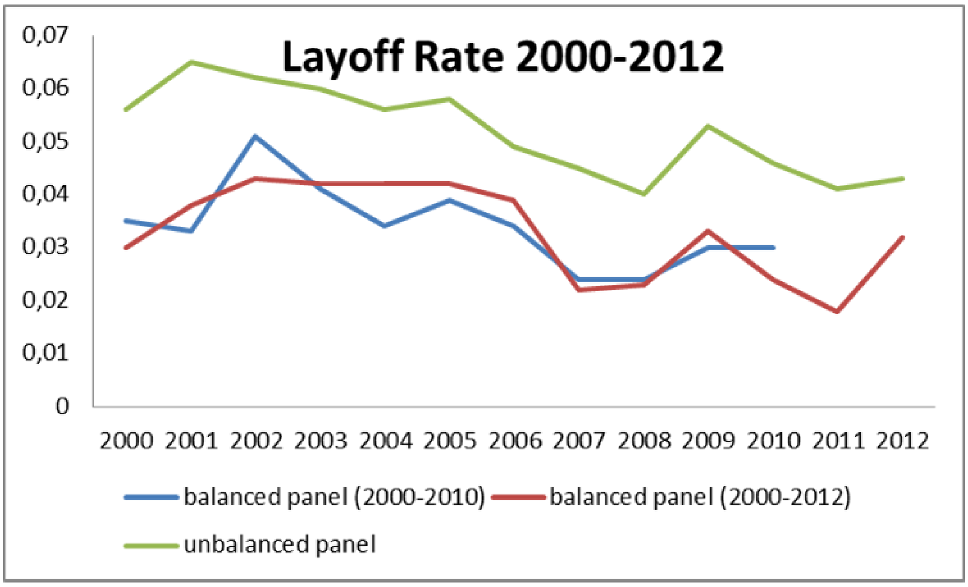

b: Sales Growth 2000-2012
0,06
0,04
0,02
0
-0,02
-0,04
-0,06
-0,08
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
balanced panel (2000-2010)
balanced panel (2000-2012)
unbalanced panel

Figure 7: Employment Growth, Sales Growth, Separation Rate and Layoff Rate (cont.)



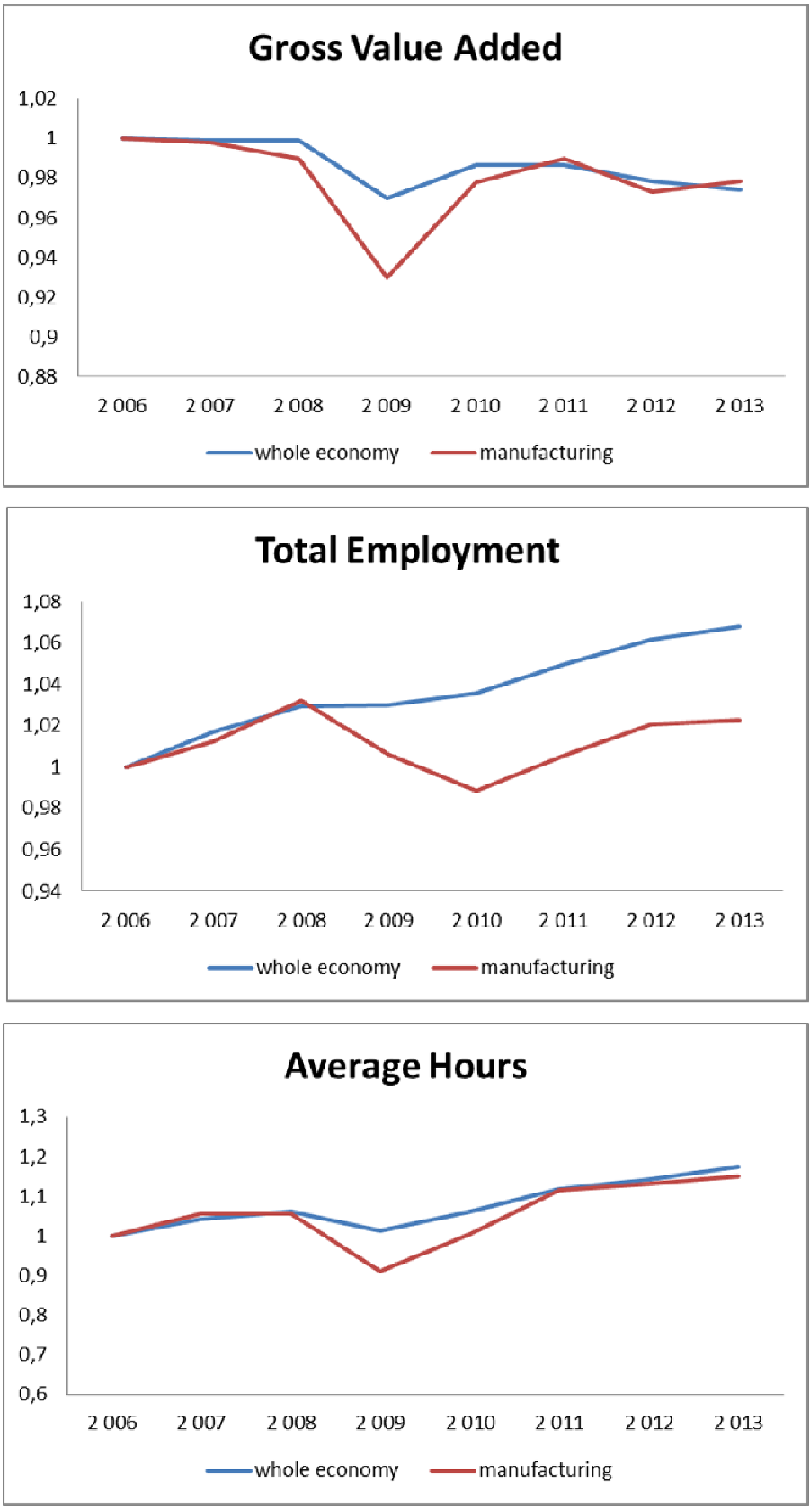


Notes: Employment and sales growth rates according to the IAB-Establishment Panel Survey. The full sample is weighted by cross-section weights; the balanced sample is weighted by longitudinal weights. Sales are reported for the previous calendar year. Employment refers to employment on June 30th in the current calendar year. Separations and layoffs refer to the first six months of the current calendar year.

Source: Own calculations based on the IAB-Establishment Panel Survey.

One important distinction has to be made when talking about the pre-and post-crisis productivity development in Germany: Not every sector was hit equally by the economic downswing and this may be an additional explanation as to why Germany's productivity development pattern was unusual. Regarding figure 8, which compares the changes in gross value added, total employment and average hours worked between the manufacturing sector and the whole economy during 2006-2013, it becomes clear that the 2008/2009 recession mainly affected the manufacturing sector. Within this sector, primarily producers of investment goods and consumer durables, as well as their suppliers suffered from the recession. Additionally, due to their dependence on the world economy, Germany's export-oriented firms incurred a demand shock and therefore were affected most strongly by the repercussions of the recession. In line with this, it is also the manufacturing sector which suffered the most severe employment losses. Notably though, these effects rarely spilled over to more consumer-oriented services, as evidenced by the observable differences between manufacturing and the whole economy (figure 8). The decline of total employment in the manufacturing sector had not recovered in 2010, again highlighting the disparities between manufacturing and the whole economy (which not only rebounded but increased its total employment compared to the pre-crisis level). Finally, the average hours worked declined much more severely in the manufacturing sector compared to the whole economy, indicating a reduction in labour productivity that was more pronounced in manufacturing than elsewhere.

Figure 8: Gross Value Added, Total Employment, Average Hours (2006-2013)



Notes. Differences between manufacturing and the whole economy 2006-2013. GVA, employment and hours indexed 2006-100.
Source: German Federal Employment Agency.

The macroeconomic overview of this section has pointed out some unexpected behaviours of the German labour market to the Great Recession of 2008/2009. While productivity plummeted in 2009, the labour market remained surprisingly resilient and this might also be part of the explanation of Germany's rather quick productivity recovery in the months directly following the crisis. Mainly the manufacturing (and export-oriented) sector was affected by the downswing. Additionally it was pointed out that German establishments primarily adjusted employment on the intensive margin, as opposed to the extensive margin. Both observations may additionally explain the pattern of economic development in Germany after the crisis. In order to further clarify Germany's productivity development and to allow inferences about best practices for future economic downswings, the next sections focus on the reasons for Germany's so called "Jobs Miracle" and highlights the importance of the strong social partnership which currently exists in Germany.

4. Germany's jobs miracle

As was emphasised above, Germany experienced an unusually severe decline in its GDP[8] during the 2008/2009 recession, however, the corresponding employment response was surprisingly moderate. This phenomena prompted Nobel Prize winner Paul Krugman (2009) to speak of „Germany's jobs miracle" in his New York times column and provoked animated discussions about Germany's labour market resilience. In order to embed these debates in economically founded arguments, the following section shortly describes previous patterns caused by downswings in Germany and then explores reasons for deviating patterns that were observed in the 2008/2009 recession.

Economic downturns tend to have a distinct pattern in Germany in which the employment path habitually mirrors changes in GDP with a slight delay (Möller, 2010). However, the response of the German labour market to the 2008/2009 recession did not follow this pattern; rather, seasonally-adjusted unemployment remained stable and was even falling in 2010. Regarded in more detail, it can be observed that mainly the manufacturing sector suffered employment losses (also see figure 8). However the effects of the crisis rarely spilled over to

[8] Möller (2010) observes a 5 percent decline in Germany's GDP, while Burda and Hunt's (2011) calculations reveal an even higher drop and indicate that the GDP fell 6.6 percent from its peak in 2008Q1.

the consumer oriented services, such as for example health care and social services, education or the hotel and restaurant sectors and therefore did not hit the whole economy equally. Finally, given the extent of the crisis, even the manufacturing sector's employment response was moderate.

Several explanations to these puzzling observations should be pointed out (see table 2) and will be discussed in more detail in the following section.

Table 2: Reasons for Germany's jobs miracle

Reasons for Germany's job miracle	
favourable conditions and high competitiveness of firms prior to the crisis	- wage and employment moderation in pre-crisis times
	- pre-crisis upswing
	- labour market reforms
	- (perceived) scarcity of skilled personnel
	- mainly competitive manufacturing sector was affected
government intervention	- bailout packages
cooperation of firms, social partners, works councils and individual employees allowing the exploitation of within-firm flexibilities	- short-time work
	- working time accounts
	- pacts for employment and competitiveness

Source: Own illustration.

4.1 Favourable pre-crisis conditions

Several (labour) market characteristics aided the favourable employment development observed during and after the Great Recession. Specifically the good economic conditions prior to the crisis can be seen as a reason for the structural break in the crisis response (Möller, 2010): First, the downturn mainly affected the manufacturing and export-oriented sectors and within these sectors the producers of investment goods and consumer durables and their suppliers. According to Rinne and Zimmermann (2013), GDP dropped by 18 percent in 2009 for the manufacturing sector. Notably however, in Germany's export-oriented economy, the firms in these sectors represent a positive selection and this positive selection then had to handle a temporary demand shock with a relatively quick recovery as soon as 2009. In a major German economic prognosis export growth rates were already expected for the third quarter of 2009 (Carstensens et al, 2009) and by 2010 manufacturing output had already increased by 11.5 percent (Rinne & Zimmermann, 2012). Additionally, German firms had initiated improvements to expand their competitiveness by generating demand for their products at the beginning of the 2000s (Walwei, 2014). Not surprisingly, the role of exports for Germany's economy is especially important and approximately one fourth of all jobs is depend on trade (Statistisches Bundesamt, 2011).

Highly productive and innovative exporting manufacturers[9] were able to take advantage of two circumstances: First, they had benefited from an upswing in international demand prior to the crisis. Second, due to the quick recovery of Asian economies, they could take advantage of a post-crisis demand increase for German products (Bornhorst & Mody, 2012). While most of Germany's trade takes place within the European Union (EU27: 59 percent; Europe: 71 percent), Asia is responsible for 16 percent of all German exports and China was Germany's fifth largest trade partner in 2011 after France, the USA, the Netherlands and the UK (Statistisches Bundesamt, 2011). Therefore, Germany indirectly profited from China's stimulus packages of four trillion yuan, mainly to be spent on the construction of infrastructure (Barboza, 2008).

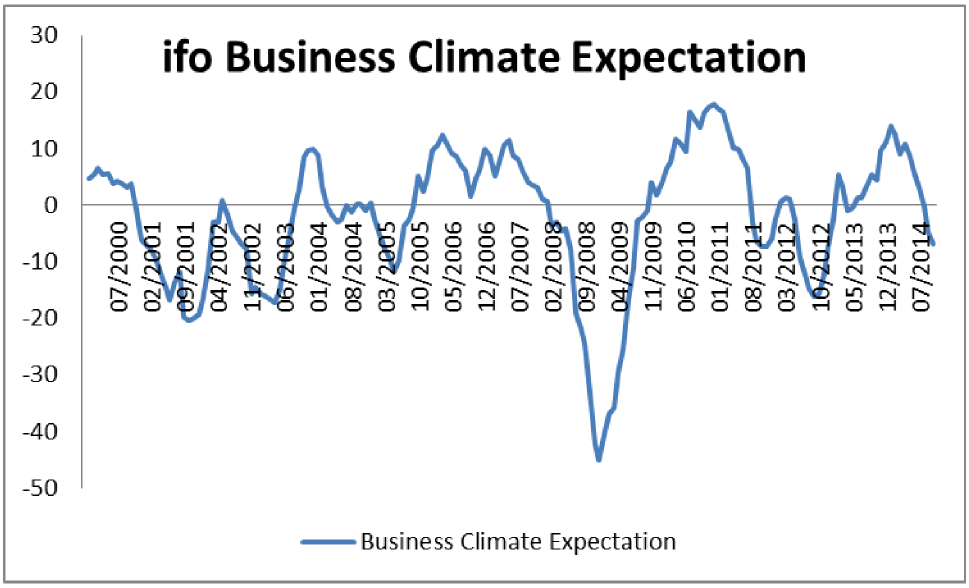
Thus, overall, the Great Recession in Germany mainly manifested as a *transitory* external demand shock - including a sharp decline in exports – with a rather quick recovery.

This transitory shock was also expected by German firms and this positive outlook certainly helped the labour market response. A good indication for Germany's business climate is the "ifo-Geschäftsklimaindex" (ifo-business climate) in which the CES ifo Group Munich[10] surveys over 7.000 firms in manufacturing, construction, wholesale and retail and asks them to evaluate their current business situation (assessed as good, satisfactory and poor) and ex-

[9] Firms engaging in international trade are considered a positive selection which is more productive and innovative compared non-exporting firms (Wagner, 2011).
[10] See http://www.cesifo-group.de/ifoHome.html for more information on the CES ifo Group Munich.

pectations (assessed as more favourable, unchanged, less favourable) for the following six months[11]. These assessments are then weighted dependent on the importance of the firm's industry. The expected business climate index is the mean of the balance value, i.e. the difference of percentages of the responses "more favourable" and "less favourable" of the business expectation. The index can fluctuate between -100, i.e. all firms expect the business climate to become worse, and +100, i.e. all firms expect the business clime to improve. Figure 9 depicts the development of the monthly business expectations of German firms. This graph clearly depicts that business expectations plummeted towards the end of 2008, but quickly recovered as soon as the beginning of 2009.

Figure 9: The development of the business climate expectation for Germany (2000-2014)



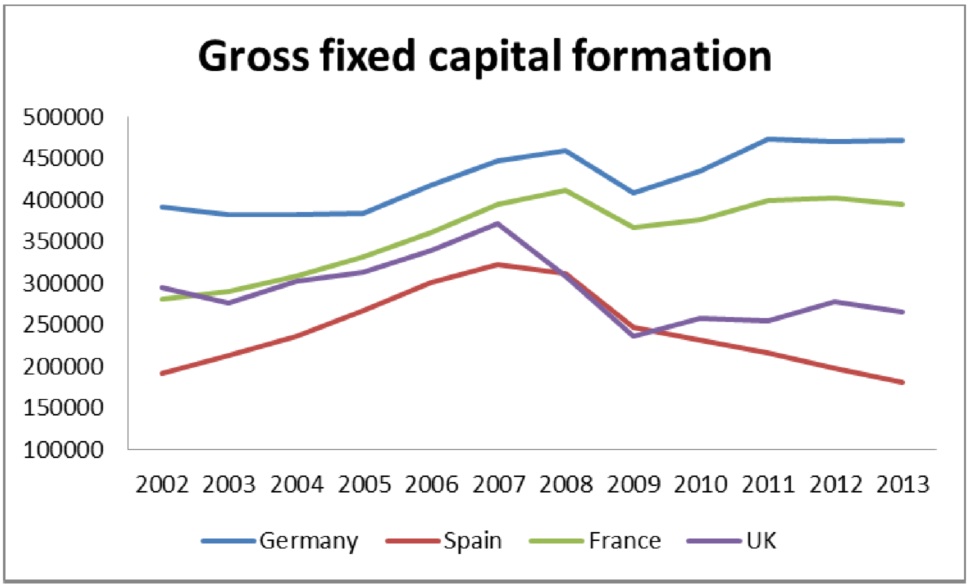
Source: Ifo Institute (2014).

Another influence on the business climate is certainly the political debate. It became clear early on that Germany's government proactively dealt with the crisis and introduced several measures to stabilize the economy (see 4.3). Furthermore the government was able to sell these measures in a positive light to the German population (see for example the speech

[11] For more details on the calculation of the "Geschäftsklimaindex" see: http://www.cesifo-group.de/de/ifoHome/facts/Survey-Results/Business-Climate/Calculating-the-Ifo-Business-Climate.html.

held by Frank-Walter Steinmeier on January 14th 2009[12] on the introduction of the government bailout packages). This perspective of the population is an interesting side note worth looking at. In a recent study, Gerner and Stegmaier (2013) look at google searches for the terms “crisis”, “financial crisis” and “economic crisis” in their German equivalents. Interestingly, the transitory character of the crisis is reflected here as well. In the third quarter of 2008 the searches for “financial crisis” (Finanzkrise) spiked, but as soon as the first quarter of 2009 fell back almost to pre-crisis levels. The same pattern, albeit with a smaller amplitude, emerges for the terms “crisis” (Krise) and “economic crisis” (Wirtschaftskrise). Hence, these pattern indicate that not only businesses but also the population in general perceived the threat of the crisis to be diminishing as soon as 2009.

Figure 10: Capital Investments



Notes: In million Euros.

Source: Eurostat (2014f).

Finally, another good indication for future expectations of firms is capital investment. Gerner and Stegmaier (2013) describe the short-term effects of the crisis on firm-level investment plans and show that firms which were affected by the crisis reduced their investment plans. In these cases, larger establishments postponed their investments due to a lack of debt capi-

[12] The speech can be found under: http://www.bundesregierung.de/Content/DE/Bulletin/2009/01/03-2-bmaa-bt.html.

tal and smaller firms due to a lack of sales. Looking at the aggregate level, the development of gross fixed capital formation in Germany in comparison to other European countries is of interest. Figure 10 depicts the gross fixed capital formation for Germany, Spain, France and the UK. Again, as with the business climate expectations, this graph shows a dip in investments in 2009 coupled with a quick recovery implying that investments were deemed worthwhile by German firms again starting in 2010[13]. A similar pattern can be observed for France and the UK, however to a lesser degree.

To summarize, an important feature of the German experience of the Great Recession is the belief that the crisis would be short lived. This statement is corroborated by firms expectations measured through the business climate index and capital investments, as well as by the German population's perceptions. The quick political intervention further helped forge this positive outlook.

In addition to the prediction that the crisis would be short-lived, German firms also expected - and rightly so - that the emerging markets would become important export markets for Germany. Therefore these firms "prepared" their economic recovery by strategically hoarding labour and even recruiting skilled personnel (Bellmann & Huebler, 2014). It can be stated that "skill shortages are an increasingly common long-run phenomenon with a break during the recession" (Bellmann & Huebler, 2014, 817f.). Therefore it can be assumed that firms behave according to the perceived skill shortage of skilled workers[14] and refrained from laying off the group of employees considered most valuable[15]. This hypothesis is likely as demographic changes and the resulting decrease in the working population is stated as one of the main future challenges for the German labour market (Caliendo & Hogenacker, 2012). Overall, the interaction between the shortage of skilled workers and the possibility to implement short-time work as well as other forms of working time reductions worked in favour of labour hoarding (Rinne & Zimmermann, 2011). Thus, labour hoarding resulting from the per-

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[13] Germany's government schemes implemented to stimulate Germany's manufacturing and construction industries certainly helped this positive outlook.

[14] According to calculations based on the IAB-Establishment Panel, two thirds of the establishments expected facing a skill shortage within the next two years in 2011 (Bechmann et al., 2012).

[15] In line with the shortage of skilled workers argument is the hypothesis that firms were subject to recruitment problems prior to the crisis and therefore had incentives to hoard labour during the recession to avoid re-hiring in the following upswing. However, using statistical twins and comparing firms with recruitment problems with their matches, this hypothesis cannot be confirmed (Klinger, Rebien, Heckmann, Szameitat, 2011). Thus it seems that recruitment problems prior to the crisis were not a reason for Germany's moderate employment response.

ception of establishments that employees are valuable was a main determinant of maintaining low levels of unemployment during the crisis.

Second, compared to the world market, unit labour costs[16] developed favourably for Germany due to wage moderation or even wage stagnation from 2001 to 2008 (Burda & Hunt, 2011). This wage moderation resulted in part from reduced pressures during collective negotiations due to labour market reforms making employees more willing to apply for less-paid jobs (Caliendo & Hogenacker, 2012). As employment additionally increased less than expected considering the preceding expansion, layoffs could be avoided during the recession. Moreover, bringing more labour market flexibility, the labour market reforms[17] between 2003 and 2005 "cured" Germany from being the "sick man" [18] of Europe (Caliendo & Hogenacker, 2012; Rinne & Zimmermann, 2013; Walwei, 2014). The reforms added to a favourable pre-crisis labour market condition by increasing employment growth and reducing unemployment. Rinne and Zimmermann (2013, 4) claim that the reforms "made Germany less vulnerable to economic shocks". Therefore they are deemed to be key to Germany's jobs miracle, as they increased the effectiveness of the labour market by handling the persistent supply problem and ensuing unemployment trap. Additionally, they lowered unit labour costs thereby increasing international competitiveness and allowing firms to build up financial reserves before the crisis. Thus, today Germany's image changed from the sick man of Europe to "economic superstar" (Dustmann et al., 2014). As this transformation of the labour market had such far-reaching consequences, the next section will look more closely at the Hartz IV reforms.

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[16] According to Caliendo & Hogenacker (2012) unit labour costs in Germany were reduced by 2 percent between 2000 and 2007.

[17] Fundamental labour market reforms called the "Hartz reforms" were introduced by the Schröder government starting in 2003 and enforced in several steps until 2005. The focal aim of the Hartz reforms was the increase of labour market flexibility which was achieved through the introduction of lower levels of job protection, deregulation of temporary work, reduction of the maximum period for unemployment benefits and a new uniform benefit system, as well as a restructuring of the Federal Employment Agency. For a more detailed overview of the pre-reform state of the German labour market, as well as of the reforms and their future challenges see Caliendo & Hogenacker (2012), as well as Walwei (2014).

[18] In 1999, The Economist published an article with the headline "The sick man of the euro" to draw attention to the worrisome situation in Germany: "The biggest economy in the euro area, Germany's, is in a bad way. And its ills are a main cause of the euro's own weakness" (The Economist, 1999).

4.2 The Hartz IV reforms

In 1999, “The Economist“ referred to Germany with the meaningful headline “The sick man of the Euro“, because of a high and increasing level of unemployment since the first oil-crisis in the mid-1970s, the high financial burden due to German reunification and an underdeveloped service sector to mention just a few problems (Walwei, 2014). Many European countries had to face high unemployment rates in the 1990s, but Germany had especially proven to be unable to benefit from favourable conditions in the global economy by that time. At only 1.8 percent, Germany’s GDP growth between 1991 and 2003 was only half of the UK growth rate, leading to decreasing employment and increasing unemployment (Jacobi and Kluve, 2007). Germany’s slow response to the worsening labour market situation can only be explained by a long period of reform blockage and postponement in labour market policy adjustments (Reformstau, see Eichhorst and Marx, 2009). As one of the main responses to these challenges, former Chancellor Gerhard Schröder began a fundamental reform of the German labour market, the so-called Hartz Reforms.

When the Federal Employment Agency (BA) was accused of massive fraud in reporting successful job placements in the beginning of 2002, the government appointed an independent expert commission, which worked out the blueprint for the reform package known as the Hartz Reforms[19]. This reform package consisted of four laws (Hartz I-IV), which were implemented incrementally between January 1, 2003, and January 1, 2005, and introduced some rather radical changes in German labour market policy. Hartz I introduced the concept of personnel service agencies (Personal-Service-Agenturen), which were attached to the Local Employment Agencies (LEAs) and were supposed to employ unemployed individuals, hire them out to companies and organizations, and train them when not hired out. Hartz I also tightened the conditions for the acceptability of jobs and introduced training vouchers unemployed individuals could use to get training from approved providers. The second amendment, Hartz II, introduced new regulations for minor jobs (Mini- and Midi-Jobs) and a second start-up subsidy (Ich-AG) for unemployed individuals starting in self-employment (in addition to an already existing start-up subsidy scheme). Hartz III addressed the organizational struc-

[19] The Hartz Reforms were named after the chairman Peter Hartz, who headed the commission. The official names of the Hartz I-IV laws were Erstes, Zweites, Drittes and Viertes Gesetz für moderne Dienstleistungen am Arbeitsmarkt (Bundesministerium für Wirtschaft und Arbeit, 2003)

ture of public employment services, and altered existing programs, as well as introducing new ones, within the area of active labour market policy (ALMP).

Founded by contributions from both employers and employees and administrated by the BA unemployment benefits (UB, Arbeitslosengeld) are based on prior earnings amounting to 67 percent of the next remuneration for unemployed with at least one child and 60 percent otherwise. Prior to the Hartz IV Reforms after the UB entitlement period expired unemployment were eligible for unlimited and means tested unemployment assistance (UA, Arbeitslosenhilfe) which was also related to prior earnings but only 57 percent and 53 percent with and without children respectively. Then, social assistance (SA, Sozialhilfe), provided basic income protection on a means-tested and flat-rate basis for all German inhabitants. This assistance was independent of employment experience but conditional on not having other resources of earned income, social benefits or family transfers.

Hartz IV replaces the former UB and SA by a single means-tested replacement scheme – unemployment benefit II (UB-II – Arbeitslosengeld II) – for the needy unemployed job seekers and their household on a flat-rate basis comparable to former SA. For unemployment benefit I recipients (UB-I, Arbeitslosengeld I), the most drastic change concerned the duration of benefit entitlement: The maximum duration was cut down to 12 months for people aged below 58 years. For older unemployed the threshold was higher and changed thereafter. Thus, for former UA recipients, the transfer level decreased with the goals to reduce the burden of taxation, non-wage labour costs and to raise incentives to find a job. According to the Hartz III Reform, more effective job placement and improved ALMP were designed to assist the unemployeds' efforts. In addition more flexible forms of employment like fixed-term and agency employment has facilitated the entrance to the labour market.

Only a few empirical studies have evaluated the macroeconomic effects of the Hartz reforms in detail. Fahr and Sunde (2009) as well as Klinger and Rothe (2010) use a stock-flow matching approach based on administrative data from the BA to determine the speed of unemployment outflows after the first three Hartz Reforms. Their results indicate that the first two reform waves did indeed have a significant positive impact on the process of job creation. Both studies, however, emphasize that their results might be prone to measurement error, since the BA changed definitions and statistics during the reform process, often making clear-cut identification strategies impossible. Furthermore, the studies also make no statements concerning the quality and the duration of new jobs (Caliendo and Hogenacker 2012).

Launov and Wälde (2014) estimate the incentive and welfare effects of the Harz IV reform using a macroeconometric model. Their results reveal that less than 0.1 percentage points of the decline in the observed unemployment rate can be explained by the Hartz IV Reform. For qualified unemployed the reduction of UB II in comparison to the "old" UB is large but irrelevant, because the number of long-term unemployed is relatively small in this group. In contrast the number of long-term unemployed is relatively large among the unemployed without a vocational or an academic degree. However in this group the reduction of UB II in comparison to the "old" UB is small. In contrast, they attribute a substantial influence to the Hartz III Reform.

Launov and Wälde (2014) also find heterogeneous wage effects, which can be explained firstly by both a lower tax rate and contribution rate because of the lower unemployment rate due to labour market reforms. Thus, the net wage rate will increase. Secondly, unemployed tend to accept jobs with lower wage offered because of lower unemployment benefits. Thirdly, the decreased number of unemployed leads to a lower number of job applicants which in turn raises the wages firms offer.

Last but not least, the introduction of a general, legal minimum wage of 8.50 Euros per hour on January 1st, 2015 will increase the wage level of low wage earners. Thus, it will support the collective wage systems as a lower limit. Exemptions will be valid e.g. for young people for internships during their education and if a collective agreement states lower wages (until 2016). Since one main problem of evaluations are considerable time lags between program and a possible impact, so that the implementation of the evaluation of medium- and long-term effects is not possible immediately (Caliendo and Hogenacker 2012, 9), it is difficult to disentangle the effects of the Hartz Reforms and the introduction of a general, legal minimum wage.

However, some predictions for the wage level, as well as employment, can be made. The minimum wage will increase labour costs, specifically those of marginally employed workers. For this group, a wage increase of 12 percent is expected, which is relatively high compared to an expected wage increase of 0.4 percent for employees subject to social security (Wollmershäuser et al., 2014). Overall, it is expected that the introduction of the minimum wage will increase hourly wages by 0.8 percent for the whole economy. Arni et al. (2014) ran simulation analysis to evaluate the minimum wage's effects on employment. According to these simulations, labour demand will decrease by 1 percent for men and by 2.2 percent for women due to the minimum wage with slightly higher effects in East Germany compared to

West Germany. Despite these estimations, the overall effect of the minimum wage will remain to be evaluated after its introduction in 2015.

4.3 Government intervention

Government initiated schemes helped stabilize Germany' economy. On a large scale, the "Rettungspaket zur Stabilisierung der Finanzmärkte" (bailout package for the stabilization of financial markets) aimed to prevent the collapse of the economy by stabilizing the German banking system. This bailout package rested on three pillars: First, the government guaranteed for credits and bonds amongst banks to increase credibility and trust. Second, the government directly invested in floundering banks and third, the government guaranteed for the safety of private savings. In addition to stabilizing the financial system, several schemes[20] were introduced to activate the German economy. An example for such a scheme is the "Abwrackprämie" (also called "cash for clunkers"), which is a government subsidized allowance for car owners buying new cars in exchange for their old ones. This scheme helped soothe the lack of demand in the automotive industry and thereby helped stabilize the sectors that suffered most from the economic shock.

4.4 Within-firm flexibilities

Several within-firm flexibilities were implemented to help firms remain active during economic hardships with the overall effect of increased labour hoarding during the crisis months. Labour hoarding[21] refers to firm's practice of not immediately adjusting their employment levels, i.e. number of employees, when the demand for products or services decreases. As labour hoarding is to some degree inevitable for core staff in Germany due to institutions, such as employment protection legislation, a certain time lag is to be anticipated. However, the extent of labour hoarding in Germany during the crisis was larger than could be expected and most visible through the introduction of short-time work, the depletion of working time accounts and an ensuing reduction in productivity per hour. One possible assumption is that firms reacted to the fear of a looming shortage of qualified workers in addition to the expectation that the shock would be short-lived. Labour hoarding was therefore considered a sensible tool to retain the qualified core staff and remain competitive in the future without the need to hire

[20] For an overview of stimulus packages in Germany see Rinne and Zimmermann (2011).

[21] For a more detailed overview of the rationale, benefits and impact of labour hoarding during the 2008/2009 recession in Germany see Dietz, Stops and Walwei (2010).

and train new personnel upon demand improvements. Thus, common to most establishments in Germany is that labour input was adjusted at the intensive rather than at the extensive margin.

A distinct reason for labour hoarding and thus the labour market resilience was the within-firm flexibility achieved through labour market instruments. This flexibility was made possible by the social partner's willingness to cooperate with each other in an extreme situation, thus supporting Germany's surprising development during the crisis. Amongst the instruments mainly employed are short-time work schemes, working time accounts and company-level pacts for employment[22].

4.4.1 Short-time work

Cyclical short-time work ("*konjunkturelle Kurzarbeit*") is one form of short-time work that is used to overcome temporary, unavoidable loss of work due to economic factors or unavoidable incident (§ 170 Social Code III). Short-time work can be requested by an establishment's management or the works council for economic hardship only after other flexibility tools, such as the reduction of overtime, working time accounts and holidays, have been depleted. The establishment can then submit a plan to the local employment agency[23].

Short-time working compensation can be awarded to all employees covered by the social security system with a loss of 10 percent or more of gross monthly earnings. The income loss is first compensated by the establishment which pays 60-67 percent of the net income payed before the implementation of the short-time working scheme. After the working time reduction the establishment is then reimbursed by the German Federal Employment Agency. During the 2008/2009 recession, the government additionally paid up to half of the social security contributions. Furthermore, the short-time working compensation eligibility was extended to a maximum of 24 months in January 2009 (and subsequently reduced to 12 months).

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[22] Another possible instrument which could help overcoming the crisis is profit sharing. Bellmann and Möller (2015) investigate the hypothesis that firms with profit sharing and employee share ownership schemes are better off during a crisis. However, they do not find significant effects of these schemes on employment, sales or wages and conclude that profit sharing and employee share ownership are not very meaningful instruments in a crisis situation.

[23] The German Federal Employment Agency is divided into regional subunits according to states (Bundesländer) called "Regionaldirektion" and further divided into local employment agencies "Agenturen für Arbeit", which are responsible for smaller regional units within the Bundesländer.

Short-time work started to increase in the third quarter of 2008 and reached its peak in June 2009 with more than 63,000 affected establishments and 1.4 million affected employees, resulting in an overall cost for the Federal Government of five billion Euros for the fiscal year of 2009 (Bellmann, Crimmann, Wießner, 2012). However, by the end of the year the number of employees subject to short-time work was already reduced by half.

There is some evidence that short-time work has contributed to labour hoarding (Dietz et al., 2010) and Bellmann, Crimmann and Wießner (2012) show that the labour market instrument was mainly used to protect the core staff and to avoid losing qualified employees. In turn, this may have allowed establishments to bounce back once demand for products increased.

While short-time work contributed to reduce job losses during the recession, the number of jobs saved was estimated to be smaller than the number of participants and the full-time equivalent jobs involved (Boeri & Bruecker, 2011). However, the use of short-time work was also highly dynamic and employees remained in short-time work for an average of four months in Nuremberg, Bavaria for example (Scholz, Sprenger, Bender, 2011).

Furthermore, the use of short-time work schemes is strongly associated with falls in sales and German establishments using short-time work experienced comparably large falls in labour productivity (Bellmann, Gerner, Upward, 2012). But, overall, it can be shown that the existence of short-time work stabilized unemployment fluctuations by 15 percent and output fluctuations by 7 percent (Balleer et al., 2013).

4.4.2 Working time accounts

Working time accounts are management tools agreed upon in collective bargaining agreements. “Working time flexibility in collective agreements often takes the form of working time accounts, allowing companies to deviate temporarily from the agreed average weekly working time by compensating the worker with free time within a specific period” (Werner, Bennett, König, Scott-Leuteritz, 2004, 713). Thus, working-time accounts are firm-level agreements allowing actual working hours to vary from the agreed hours without changes in hourly wage rates for agreed periods of time, for example within a one-year framework. This means that firms can save labour costs during short-term demand increases and in turn hold on to employees during a recession.

Hence, with the help of an annual working time account, overtime above a certain threshold could be accumulated prior to the crisis, i.e. during the upturn of 2005-2007, and compensated by free time during the worst parts of the crisis. There is an argument that this particular counter-measure worked well, because employees had built up large surpluses during the upswing, which would have had to be compensated in case of layoffs (Burda & Hunt, 2011). However, Bellmann and Gerner (2011) compare employment growth during the crisis between establishments with working time accounts and those without and find no evidence that plants with working time accounts had smaller employment adjustments. Still, an earnings smoothing effect manifested. Overall though, establishments were able to hold on to their employees who worked fewer hours until the accounts were emptied all the while avoiding costly layoffs. At the time when accounts were nearly depleted, an upswing was foreseeable, making layoffs – especially of qualified workers – an undesirable decision, additionally contributing to the resilience of the German labour market.

4.4.3 Pacts for employment and competitiveness

A remarkable phenomenon of the crisis was the substantial cooperation between individual establishments, their employees and works councils. Collective bargaining arrangements had become more flexible in Germany in recent years to allow deviations from industry-level agreements in the form of opening clauses. As specific case of opening clauses, company-level pacts for employment demand concessions from both the employers and the employees. However, while a certain flexibility in collective bargaining agreements could be observed prior to the crisis, company-level pacts for employment were increasingly used during the crisis, highlighting the efforts of the social partners, as well as individual firms and employees, to work together in order to overcome the recession. This strongly aided the German economy during the crisis, but also in post-crisis times, as productivity levels could be picked up again without re-employing workers.

Pacts for employment and competitiveness are typically based on an agreement between management and the works council representing the employees in which both sides make concessions in order to maintain the firm's competitiveness and employment level. During the crisis, company-level pacts for employment mainly implied that employees and/or works councils agree to a temporary reduction in wages for a specific period in exchange for employment security. While there is evidence that establishment which did not have employment losses were those more likely to have adopted a company level pact for employment (Bellmann & Gerner, 2012), more analysis is needed to fully understand the impact of these pacts.

In summary, in order to maintain a qualified workforce in the face of the pending shortage of qualified employees, flexibility was executed through working hours and wages and not through the number of workers. In turn, German establishment's tendency of labour hoarding allowed for a quick and efficient increase in productivity once the demand shock receded and low productivity levels could quickly be overcome.

Overall, it can be concluded that Germany's jobs miracle was due to a combination of several measures which mainly depended on the successful interaction of establishments, works councils, social partners and the government. This deduction specifically emphasises the importance of a functioning social partnership for the usefulness of shock absorbing institutions and instruments. Therefore, the next section of this chapter will focus on the particularities of Germany's industrial relations and their importance for long-term sustainable productivity development.

5. A driving force of productivity development in Germany: Industrial relations

This chapter's main focus lies on the system of industrial relations in Germany for several reasons. It can be argued that Germany's system of industrial relations is based on four pillars - collective bargaining, works councils, opening clauses and company-level pacts for employment – and that the combination of these four pillars is a driving force of stable development in Germany. More importantly though, it has been pointed out, that the behaviours of the social partners "have strengthened (…) adjustment possibilities when facing a slump" (Möller, 2010, 325). Indeed, Dustmann et al. (2014, 168) argue that it is not the Hartz IV reforms or the trade balance in the Eurozone that enabled Germany to transform itself from the "sick man" of Europe to an "economic superstar" but rather that the "specific governance structure of the German labour market institutions allowed … [Germany] to react flexibly in a time of extraordinary economic circumstances, and that this distinctive characteristic of its labour market institutions has been the main reason for Germany's economic success over the last decade". Carlin and Soskice (2009, 68) argue in a similar direction and point out that "Germany's coordinated economy model, including unions, works councils and blockholder owners" explains the country's strong economic performance since the 1990s. The authors expand their argument by highlighting that the restructuring of the labour system was mainly carried out by private sector agents, i.e. unions, employer association, firms and works councils, while the government only played a minor role. Moreover, the restructuring led to an increased consensus-based decision making process and a greater alignment of firm and employee interests.

5.1 Germany’s dual system of industrial relations

The collective bargaining system, as well as unions and employers’ associations, have been legally recognized in Germany since the end of World War I (Schnabel, 2005). While the state was still able to intervene in the decisions of the social partners during the Weimarer Republic, Germany now relies on the principle of tariff autonomy. Thus, the state does not interfere with the functions and decisions of the collective bargaining system, rather it merely defines the legal framework in which collective bargaining agreements take place. Within this framework the tariff autonomy relies on article 3, paragraph 3 of the German Constitution, which gives the „right to form associations to safeguard and improve working and economic conditions (…) to every individual and to every occupation or profession“.

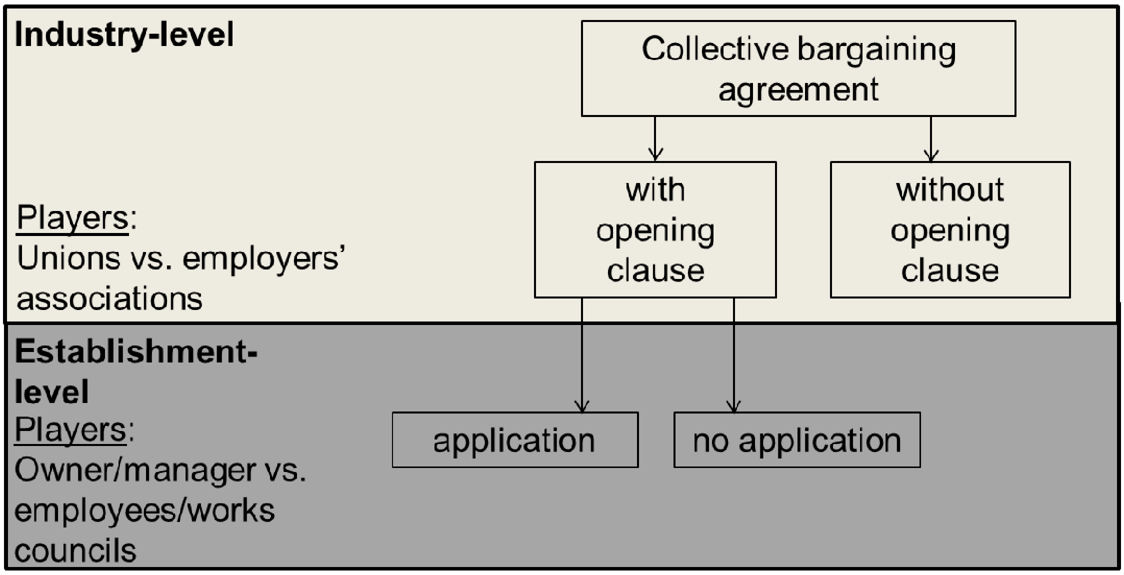
While coverage has declined since the mid-1990s (Kohaut & Ellguth, 2008), collective bargaining agreements are still the most important bargaining mechanism in Germany. Accordingly tariff commitment, i.e the share employees who are subject to collective bargaining agreements, still ranges around 52 percent in West and 33 percent in East Germany in 2007 in the private sector (Kohaut & Ellguth, 2008). Company-level agreements are less frequent with 7 percent and 12 percent respectively in West and East Germany. Newer analyses with the IAB Establishment Panel Wave 2012 reveal that 53 percent of all employees in West Germany and 36 percent of all employees in East Germany are covered by a multi-employer collective agreement. Despite lower coverage compared to the 1990s, the importance of industry-level agreements is not diminished as over 40 percent of all firms not subject to collective agreements still base their wages and employment conditions in reference to a collective bargaining which affects approximately 50 percent of all employees who are not subject to a collective bargaining agreement and many other firms use the terms of collective bargaining agreements as gold standard.

Traditionally, on the industry-level, regional industry-wide collective bargaining agreements negotiated between unions and employer associations determine working conditions, for example working hours, employment security, and wages (see figure 11). According to German Labour law, they overrule (or complement) individual contracts. Works councils[24] then negotiate employer-employee relations and regulate further working conditions at the establish-

[24] For more details on German works councils see Addison (2009).

ment-level. Thereby, the industry-level agreements function as reference point, making a clear distinction between these two pillars of the dual system difficult.

Figure 11: The dual system of industry- and establishment-level bargaining



Source: Own illustration.

The institution of the German works council is legally based on the Works Constitution Act, which states that a works council can be formed in establishments with at least five employees, three of whom must be eligible for election (§ 1). However, the formation is not automatic as it needs to be triggered by the employees. The works council consists of employees elected for four years and their numbers vary with establishment size (§ 9). Once elected, the works council has considerable rights (information, consultation, objection and codetermination rights) and its influence mainly extends over personnel affairs and working hours or overtime. Nevertheless it is restricted in its capabilities by its obligation to take the welfare of the establishment into account in addition to the welfare of the employees.

Furthermore, to meet the increasing demand for flexibility in the German collective bargaining system, opening clauses and company-level pacts became fundamental instruments in the German system. Thus, since the 1980s, more areas of regulation were transferred from the industry-level to the establishment-level through opening clauses[25].

In sum, the German collective bargaining system is characterized by a multi-level bargaining structure with both centralized and establishment-level agreements. Thereby, the employment relations system is an organized decentralization with a dual system of industry and establishment level bargaining (Ellguth, Gerner, Stegmaier, 2012). One major distinction of the German system of industrial relations is that it is not based on legislation alone, but that a major part is grounded in contracts and mutual agreements between unions, employer associations and works councils (Dustmann et al., 2014). Additionally, the system has changed away from centralized bargaining to an increasing localization of the bargaining process with a stronger emphasis on the firm level. This is in line with the idea that employer and employee interests are increasingly aligned (Carlin, Soskice, 2009).The next section focuses on one manifestation of these mutual agreements and contracts, namely the increasing flexibilisation of this system through the growing application of opening clauses and pacts for employment and competitiveness. Moreover, their ramifications for overcoming the economic crisis will be discussed.

5.2 The role of company-level pacts for employment and competitiveness

Opening clauses were introduced in collective bargaining agreements in reaction to the increasing criticism of centralised bargaining agreements in Germany, which focused on the rigidity of the system. The institution of opening clauses thus accounts for the increasing demands for flexibility and shifts the focus from industry-level to establishment-level bargaining, thereby also pronouncing the role of works councils. In general, these clauses allow the departure from collective agreements at the company-level under the condition that the social partners approve.

Pacts for employment and competitiveness are a special case of opening clauses to improve competitiveness or in case of imminent (economic) hardship. The pact then includes specifically and individually tailored deviations that undercut industry-level bargaining agreements.

[25] For a detailed description of the development of the German Collective Bargaining system since the 1980s see Addison et al. (2014).

As a prerequisite the employer and the employee agree upon concessions with the goal of achieving a balance between flexibility and security[26].

On the one side, the employees agree to make concessions concerning for example wages or working time and on the other side, management in return promises for example that employees will not be laid off. From the employer's perspective, pacts for employment and competitiveness reduce labour costs and raise flexibility concerning working time and work practices. From the works council's/employee's perspective these pacts save jobs and increase job security. Thus, in contrast to "concession bargaining" known in the United States of America where only the employees renounce contractual agreements, pacts for employment and competitiveness are based on the idea that both the employer and the employee work together - and make concessions together - with the goal that the company remain competitive. Overall, pacts for employment and competitiveness thus bring together three elements of European Union economic and social policy: competitiveness, employment and social dialogue.

Bellmann (2014) assesses the advantages and disadvantages of company-level pacts (see table 3). Arguments made against company-level pacts for employment are that it may be difficult for the firms to keep the promises they made, especially in the face of severe economic deteriorations and the lack of information on the duration and severity of the crisis. Moreover, it may be in the interest of the works councils, as well as management, to save the jobs of insiders first and foremost, adding to the disadvantageous position of outsiders. Thus, at least for insiders, the illusion of job security is created. Finally, the erosion of industry-level collective agreements weakens agreements made concerning wages and working times. This erosion in turn also endangers the very basis of opening clauses and company-level pacts for employment.

[26] For a detailed description of the incidence and contents of company-level pacts for employment in Germany see Bellmann (2014) and Ellguth & Kohaut (2008).

Table 3: Evaluation of company-level pacts for employment

Advantages	**Disadvantages**
reduction of labour costs and thus increase of employees	promises made may be hard to keep when economic situation deteriorates
increase in labour productivity through flexible working time regulations and reorganizations	distortion of labour markets: insiders are favoured because of layoff restrictions and employment prospects of outsiders are worsened
aids survival of firms, saves jobs and thus fosters employment	exaggerated employment expectations going against market trends
deviations from collective agreements are restricted because unions would not agree otherwise	erosion of industry-level collective agreements
social partners are encouraged to take more responsibility for employment issues	

Source: Bellmann (2014).

These negative arguments none withstanding, company-level pacts for employment and competitiveness are appreciated as institutions stabilizing employment and maintaining competiveness. Thus, on the positive side, the main benefits of these pacts are the reduction of labour costs and the evasion of layoffs. Hence, a flexibilisation of wages and working time helps the survival of firms, helps save jobs and thereby soothes employment reactions to economic downturns. Furthermore, the conclusion of company-level pacts for employment encourages the social partners to put an increasing focus on employment issues instead of elevating wage goals. Specifically in situations of economic hardships such as the Great Recession, company-level pacts for employment and competiveness are an important tool to help overcome the ramifications of the downswing - and furthermore to allow a quick comeback upon the recovery. Thus, the German solution to the Great Recession was to cooperate against adverse conditions - an option that was made possible by a long-existing cooperative system of industrial relations.

6. Micro-economic evidence

This section of the chapter focuses on microeconomic analyses concerning the development of employment and productivity in Germany. Based on the previous explanations, industrial relations are regarded as a main source of stable development in Germany. Therefore, in order to evaluate the actual impact of company-level pacts for employment and competitiveness during the Great Recession, we analyse the effects of these pacts on jobs flows, employment and productivity.

6.1 Data overview

The following analyses are based on the *Institut für Arbeitsmarkt- und Berufsforschung* Establishment Panel Survey, a representative survey of Germany's labour demand. The annual survey of establishments began in 1993 in West Germany and has been carried out as a nationwide survey since 1996, with the addition of East Germany (Fischer, Janik, Müller, Schmucker, 2009). Representing all industries and establishment sizes, the data can be used both on a cross-sectional and longitudinal basis, as approximately 16,000 establishments are surveyed annually by TNS Infratest Sozialforschung GmbH on behalf of the IAB (Ellguth, Kohaut, Möller, 2014; Fischer, Janik, Müller, Schmucker, 2008).

The sample is drawn from the population of all German establishments with at least one employee subject to social security as of June 30th of the previous year. The Federal Employment Agency's establishment file is used as a basis for sampling. An establishment according to this definition is a "regionally and economically separate unit, in which employees liable to social security work" (Fischer et al., 2009, 135). Thus, the unit of observation in this sample is the individual establishment as opposed to the concept of a company that could comprise several establishments in different locations and separate economic units.

The random sample is drawn according to the principle of optimum stratification, taking into consideration the federal state (*"Bundesland*"), the industry sector and the establishment size. The result of this approach is a disproportionate stratification[27] in which large establishments, small federal states, small industry sectors and the manufacturing industry in East

[27] To guarantee representative statements based on the IAB-Establishment Panel Survey, the multiply disproportionate structure is corrected with a weighting procedure, which projects onto the number of establishments in the population.

Germany are overrepresented (Fisher et al., 2009). The stratification matrices have been altered over time to adapt to the changes in the system of economic sector classification. Furthermore, to counteract both panel mortality and selection effects, as well as to better reveal the dynamics of the current economic situation, new establishments are added every year. Thus, the sample is designed to ideally reflect the employment structure of Germany. The survey thereby currently covers approximately 1percent of all establishments in Germany and approximately 7percent of employees due to the weighting towards larger establishments.

The survey is generally carried out as a face-to-face interview with establishment managers; additionally written surveys are used and the response rates vary between 63 percent and 73 percent (Fisher et al. 2009). The field phase takes place in the third quarter of the year and data becomes available after an extensive monitoring and editing process, thereby guaranteeing high data quality.

The questionnaire contains about 80 questions per year which on the one hand, aims to gather information on an annual basis in order to measure developments; and on the other hand, it includes questions with current relevance. Thus the basic program consists of annually surveyed questions concerning for example business development, personnel structure, investments and bargaining arrangements. Furthermore, specific subjects are included at certain intervals, such as for example the use of short-time work or pacts for employment.

Our analyses are based on the full period from 1993 to 2013. We concentrate on the private sector only.

6.2 Descriptive evidence

Regarding Germany's productivity development, it is most noticeable that labour productivity is subject to strong fluctuations throughout the business cycle. As described above, this phenomenon is especially true during the 2008/2009 crisis, as establishments adjust labour under proportionally to changes in sales. We have emphasized the importance of institutions, which are able to take hold automatically during extreme situations such as a recession. Thus, these institutions can be taken advantage of in quick order by the establishments without first having to implement them. The institutions we consider in this chapter are short-time work, working time accounts and establishment-level pacts for employment.

As short-time work and working time accounts have been investigated intensively (for example: Bellmann, Crimmann, Wießner, 2012; Boeri, Bruecker, 2011; Brenke, Rinne, Zimmermann, 2013; Ellguth, Gerner, Zapf, 2013; Gerner 2012), we will focus on the importance of establishment-level pacts for employment and show that these pacts have little effects in “normal” times – however, they seem to be of significant importance in extreme situations such as the crisis (Bellmann, Gerlach, Meyer, 2008).

Table 4 shows the distribution of establishments with an establishment-level pact over different firm-size categories in 2008. As can be seen from this table, especially in large establishments such establishment-level pacts are very common.

Table 4: Incidence of establishment-level pacts in 2008

Overall	0.014
Not more than 10 employees	0.005
More than 10 but not more than 50	0.024
More than 50 but not more than 100	0.084
More than 100 but not more than 250	0.119
More than 250 but not more than 500	0.240
More than 500	0.345

Notes: Own calculations based on the IAB Establishment Panel 2008. Numbers are weighted.

6.3 Empirical approach and results

As can be seen from figure 7, the decrease in sales growth within the economic crisis was much sharper than the decrease in employment growth, which resulted in decreasing labour productivity (per head). In order to investigate the productivity development at the establishment level, we pursue two different approaches: First of all, we model the labour productivity at the establishment level directly by considering the following simple linear relationship:

$$\ln\,(Y/N_{it}) = \alpha^n + \alpha_i^n + \beta_t^n + \varepsilon_{it}^n, \qquad (1)$$

where $\ln(Y_{it})$ is the natural logarithm of revenue divided by the number of employees in establishment i in year t. Furthermore, α^n is an overall intercept, α_i^n an establishment specific one, β_t^n are time specific fixed effects and ε_{it}^n is an idiosyncratic error term. We estimate (1) after a within transformation by OLS. Within this regression framework we are able to show differences in the within firm development of labour productivity over time.

In a next step, we look at the relationship between sales growth (measured by the revenue) and employment in terms of job flows (measured by employment growth):

$$\Delta n_{it} = \alpha^n + \beta^n\big(\Delta y_{it} \cdot 1(\Delta y_{it} > 0)\big) + \gamma^n\big(\Delta y_{it} \cdot 1(\Delta y_{it} < 0)\big) + \alpha_i^n + \beta_t^n + \varepsilon_{it}^n \qquad (2)$$

The dependent variableΔn_{it} represents the employment growth of firm i from year t-1 to year t and Δy_{it} is the sales growth of firm i from year t-1 to year t. $[\,1(\Delta y_{it} > 0)]$ (or $[1(\Delta y_{it} < 0)]$ respectively) is an indicator function which is one if $\Delta y_{it} > 0$ (or $\Delta y_{it} < 0$ respectively) and 0 otherwise. β^n measures the correlation between positive output shocks and job flows, while γ^n identifiies the relationship betwenn negative output shocks and job flows. Again, α^n is an overall intercept, α_i^n an establishment specific one, β_t^n are time specific fixed effects and is ε_{it}^n an idiosyncratic error term. Table 5 shows the results of the basic equation (2) as well as the results of two extensions.

Table 5: Within firm development of labour productivity over time

Dependent variable: natural logarithm of revenue per worker	Basic equation	incl. control variables	For manufacturing industry incl. control variables
2000	-0,057 (0,008)	-0,050 (0,011)	-0,070 (0,016)
2001	-0,056 (0,008)	-0,050 (0,010)	-0,068 (0,015)
2002	-0,048 (0,008)	-0,044 (0,009)	-0,073 (0,014)
2003	-0,027 (0,007)	-0,018 (0,009)	-0,038 (0,014)
2004	-0,024 (0,007)	-0,004 (0,011)	-0,011 (0,015)
2005	-0,010 (0,006)	-0,003 (0,008)	0,009 (0,013)
2006	0,033 (0,006)	0,045 (0,007)	0,074 (0,012)
2007	0,037 (0,005)	0,037 (0,005)	0,089 (0,008)
2008	0,040 (0,005)	0,043 (0,005)	0,090 (0,008)
2009	Base category		
2010	0,033 (0,004)	0,040 (0,004)	0,084 (0,007)
2011	0,068 (0,005)	0,071 (0,005)	0,120 (0,008)
2012	0,067 (0,005)	0,068 (0,005)	0,107 (0,008)
Number of firms	23.436	16.967	5.636
F-value	42,57	26,57	23,79

Notes: Clustered standard errors are presented in parentheses.
Source: IAB-Establishment Panel Survey.

Table 5 shows clear evidence for a negative development of labour productivity during the crisis. While the mean value of the overall reduction is around 4 percentage points, for establishments in the manufacturing industry it is even 9 percentage points. This result reflects the fact that especially firms within this sector were hit by the economic crisis. Interestingly, in the year 2009, labour productivity felt back to the level of 2004/2005, i.e. the years Germany suffered from severe structural problems. Finally, it becomes evident that the German firms recovered very quickly from the Great recession in 2009.

Table 6 shows the relationship between output shocks and employment adjustments estimated based on equation (2).

Table 6: Estimation results of the relationship between output shocks and employment adjustment

Dependent variable: Employment growth	FE without controls 2000-2012	FE with controls 2000-2012	FE during the crisis 2008/2009 without controls	FE with controls 2008/2009	FE with controls 2008/2009 manufacturing industry
β^n	0,045 (0,005)	0,052 (0,005)	0,043 (0,018)	0,045 (0,016)	0,060 (0,021)
γ^n	0,058 (0,005)	0,072 (0,006)	0,051 (0,012)	0,072 (0,014)	0,061 (0,013)
α^n	0,017 (0,002)	0,012 (0,006)	0,020 (0,003)	-0,024 (0,025)	-0,017 (0,024)
Number of establishments	23,436	16,967	8,750	6,859	2,397

Notes: Clustered standard errors are presented in parentheses.
Source: IAB-Establishment Panel Survey.

Table 6 displays quite clearly that establishments adjust labour under-proportionally to fluctuations in output levels. In consequence, we also observe rather sizable fluctuations in labour productivity per head throughout the business cycle. Furthermore, the adjustment behaviour is asymmetric with respect to positive versus negative output changes. Finally, the pattern is robust with respect to different specifications, i.e. for the overall pattern it makes no difference whether we apply a fixed effects regression without controls, a fixed effects estimator for a specific period of time or a fixed effects estimator with control variables (where we take into account different structures of the work force - proportion of qualified workers, proportion of women, proportion of part time workers etc. - differences in firm size, in the region, where the establishment is located and sectoral differences etc.). Even an estimation for the manufacturing sector only gives similar results.

This relationship was especially prominent during the Great Recession of 2008/2009 where we observe an extreme decline in labour productivity. As described above, it is often assumed that institutions specific to Germany helped the affected establishments survive the crisis with remarkable employment resilience.

In the following analyses we will concentrate on establishment-level pacts for employment. We can show that these pacts allowed establishments to retain their employees. Thus they were a main source not only for Germany's employment resilience but also for the quick return to competitiveness once the upswing became distinct.

Table 7: Establishments having concluded a company level pact for employment in 2008 (probit estimation)

Business expectation (base: constant)		
- increasing	0.080	(0.078)
- decreasing	0.070	(0.089)
- unclear	-0.203	(0.146)
Revenue	-0.222	(0.135)
Profit situation (base: very good)		
- 2: good	0.134	(0.110)
- 3	0.040	(0.117)
- 4	0.129	(0.132)
- 5 bad	0.420	(0.137)
Technical state of plants (base: very good)		
- 2 good	-0.099	(0.089)
- 3	-0.095	(0.099)

- 4	-0.168	(0.202)
- 5 bad (empty)		
Proportion qualified workers	0.108	(0.137)
Proportion women	-0.055	(0.168)
Proportion part time workers	-0.531	(0.211)
Proportion fixed term workers	0.434	(0.319)
Independent establishment	0.045	(0.113)
Headquarter	0.217	(0.123)
Firm level bargaining contract	0.329	(0.231)
Industry level bargaining contract	0.332	(0.105)
Works council	0.940	(0.121)
Interaction firm level bargaining contract and works council	0.236	(0.266)
Interaction industry level bargaining contract and works council	0.100	(0.152)
Industry dummies (base: agriculture)		
Mining & energy	0.697	(0.415)
Food manufacturing	0.326	(0.419)
Consumer goods manufacturing	0.811	(0.380)
Producer goods manufacturing	0.851	(0.370)
Investment goods manufacturing	0.766	(0.367)
Construction	0.502	(0.374)
Trade	0.585	(0.375)

Transport & communication	0.309	(0.402)
Financial services	0.355	(0.545)
Hotels & restaurants	0.884	(0.400)
Education	0.166	(0.580)
Health services	0.799	(0.403)
Business services	0.618	(0.378)
Other services	0.604	(0.413)
East Germany	-0.120	(0.072)
Firm was affected by the crisis (information taken from 2010)	0.134	(0.068)
Number of employees	0.000	(0.000)
Constant	-3.049	(0.410)
Number of establishments	5,673	

Information for the explanatory variables is taken from 2007.

First, we look at the characteristics of establishments who have a high probability of concluding a pact for employment and competitiveness in 2008 (see table 7). It can be shown that especially establishments which were affected by the crisis and in a bad profit situation who furthermore are highly involved in the system of industrial relations, have a higher probability of implementing establishment-level pacts for employment. However, there are few significant relationships between the probability of having concluded such a pact and the other variables. A potential reason for this may be that the share of establishments with establishment-level pacts for employment is low (Huebler, 2014).

In a second step we regard how the coefficients of table 6 and 7 change conditional on the conclusion of an establishment-level pact for employment. First of all we inspect the within firm development of labour productivity by extending (1) by an interaction term between the existence of a company level pact for employment and the time dummy for 2009. We thereby concentrate on the years 2008 and 2009. The results are given in table 8.

Table 8: Estimations results for labour productivity

	FE 2008/2009 without control variables	FE 2008/2009 with control variables	FE 2008/2009 with control variables, manufacturing industry
Time dummy 2009	-0,043 (0,005)	-0,048 (0,005)	-0,105 (0,008)
Interaction time dummy 2009 and company level pact 2008	-0,077 (0,017)	-0,089 (0,020)	-0,090 (0,026)
Number of establishments	7,358	6,832	2,387

As can be seen from table 8, the decrease in labour productivity is at least around 200 percent higher in establishments with a company level pact for employment. In a next step we analyse whether there is a difference in the employment adjustment pattern between firms which adopted a company level pact for employment and those not. The identification of such differences relies on the following simple extension of estimating equation (2):

$$\Delta n_{it} = \alpha^n + \beta_1^n\big(\Delta y_{it} \cdot 1(\Delta y_{it} > 0)\big) + \gamma_1^n\big(\Delta y_{it} \cdot (\Delta y_{it} < 0)\big) + \beta_2^n(\Delta y_{it} \cdot 1(\Delta y_{it} > 0) \cdot PEC) + \gamma_2^n(\Delta y_{it} \cdot (\Delta y_{it} < 0) \cdot PEC) + \alpha_i^n + D_t^n + \varepsilon_{it}^n \tag{3}$$

where β_2^n (γ_2^n) measures the difference in the correlation for positive (negative) output shocks and job flows between establishments with and establishments without establishment level pacts. PEC thereby is a dummy which equals one if an establishment has a pact in 2008. With our regression analysis we concentrate on the two subsequent years 2008 and 2009. The results of this regression show that establishments with an establishment-level pact for employment have no significant employment adjustments (table 9). Most notably, employment is not reduced (the null hypothesis assumes that $\gamma_1^n + \gamma_2^n = 0$). This is a strong indication for labour hoarding during the Great Recession, which was hence made possible by the conclusion of establishment-level pacts for employment.

Table 9: Employment adjustments, pacts for employment and the Great Recession

	FE without controls 2008/2009	FE with controls, 2008/2009	FE with controls, 2008/2009, manufacturing industry
β_1^n	0.042 (0.018)	0.047 (0.016)	0,064 (0,022)
β_2^n	-0.025 (0.035)	-0.013 (0.039)	0,017 (0,048)
γ_1^n	0.055 (0.013)	0.068 (0.015)	0,056 (0,015)
γ_2^n	-0.045 (0.025)	-0.058 (0.027)	-0,038 (0,024)
α^n	0.019 (0.002)	-0.016 (0.029)	0,003 (0,032)
Number of establishments	7,358	6,832	2,387

Notes: Clustered standard errors are presented in parentheses.
Source: IAB-Establishment Panel Survey.

The next interesting question to be asked is which measures establishments with and without establishment-level pacts for employment took respectively in order to retain their employees. Table 10 shows the results for this question. It seems that establishments with pacts for employment were especially able to use an optimal mix of different measures in order to achieve the overall best possible outcome considering the circumstances.

Table 10: Measures taken by the establishments

Meaures duirng the crisis	Establishment with pact for employment	Establishment without pact for employment	Difference
Reduction of overtime	0.670	0.302	0.368 (0.028)
vacation	0.371	0.197	0.174 (0.025)
Short-time work	0.450	0.224	0.226 (0.026)
Reduction of wor-king time	0.130	0.086	0.044 (0.018)
Reduction of agen-cy work	0.381	0.104	0.277 (0.197)
Reduction of fixed-term contracts	0.326	0.098	0.229 (0.019)
Qualification/training	0.254	0.089	0.164 (0.018)
Limited employment of apprentices after completion of ap-prenticeship	0.205	0.066	0.139 (0.016)
Vacancies are not filled	0.437	0.166	0.271 (0.023)
Deference of previ-ously planned in-creases of person-nel	0.287	0.126	0.161 (0.021)
Lay-offs (for estab-lishment reasons)	0.190	0.126	0.064 (0.021)

Notes: Standard errors are presented in parentheses.
Source: IAB-Establishment Panel Survey.

Overall, it seems that establishments used the institutions made available by the German system of industrial relations and were therefore able to hoard labour, stabilize employment flows and remain competitive even in the face of the crisis.

7. Lessons learned

Transferences of lessons learned in the way Germany tackled the Great Recession of 2008/2009 have to be made cautiously. The previous sections have traced what happened in Germany during the crisis and highlighted that the German economy found itself in a very specific pre-crisis situation that greatly facilitated dealing with the downswing. Thus, we were able to show that the particular timing of reforms concerning labour market flexibility, the stability and ensuing competitiveness of German firms prior to the crisis, the nature and duration of the Great Recession and notably the willingness to cooperate that distinguished the social partnership all contributed to the successful overcoming of the crisis. In general however, several lessons learned can be pointed out:

- efficient labour market reforms that increase flexibility, reduce unemployment and stabilize the market are meaningful when facing economic downturns
- implementation of (labour) market instruments such as short-time work and working time accounts taking hold automatically upon economic hardships reduce the effects of the downturn due to quickly administered assistance
- a sound relationship between social partners and reduction of animosities and hardened fronts allow measures to be implemented quickly and efficiently in order to overcome economic hardship
- a strong social partnership which allows flexibilities when necessary allows the retention of long-term competitiveness
- this only works when all parties concerned realize the importance of making concessions in order for the establishments to remain alive and in order for them to bounce back quickly once an upswing is foreseeable
- the possibilities of treating collective bargaining agreements flexibly in times of hardship seems especially important when comparing Germany's collective bargaining system with that of Spain, which makes it difficult for firms to adjust to economic adversity due to aggregate level collective agreements (see chapter on Spain)

In summary, while not all conditions and economic set-ups which helped the German economy in overcoming the crisis may be transferable, some aspects such as a cooperative social partnership and efficient labour market reforms can be successfully implemented outside of the German economy.

8. Conclusion

Germany's labour market resilience in the face of the Great Recession 2008/2009 entailing a plummeting GDP was remarkable - "Germany's jobs miracle" is the term coined by Paul Krugman to describe this phenomenon. In this chapter we explored several reasons for the job miracle and highlighted the importance of Germany's strong and cooperative social partnership that allowed German firms to remain competitive and recover quickly once the worst of the crisis was over.

Overall, we show that an interaction of several reasons were responsible for the development of Germany's economy during the crisis. First, the nature of the crisis was very specific, i.e. the recession hit Germany in form of a demand shock (and less as an investment and real estate shock) and mainly affected previously competitive exporting manufacturers. Second, the pre-crisis conditions were favourable to an efficient overcoming of the crisis. These pre-crisis conditions include a pre-crisis upswing which was characterized by wage and employment moderations, several labour market reforms and a (perceived) scarcity of skilled employees. Third, the duration of the crisis was expected to be short-term, inducing firms to adjust on the intensive as opposed to the extensive margin. Thus, labour hoarding was an extensive phenomenon of Germany's reaction to the Great Recession, which was greatly facilitated by several instruments including short-time work, working time accounts and company-level pacts for employment and competitiveness.

Moreover, we believe that the multi-level bargaining system with a cooperative social partnership was key in Germany's successful coping with the Great Recession. Particular to Germany is the social partner's willingness to work together specifically in times of economic hardship. Thus, previously implemented institutions such as short-time work and company-level pacts for employment could easily be taken advantage of during the crisis. We argue that the flexibility achieved specifically by company-level pacts contributed to the retention of employees and competitiveness in German firms, thereby allowing these firms to recuperate quickly when the upswing manifested. Thus, overall it Germany's productivity development benefited from the employment stability observed during the Great Recession.

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