

Dustmann, Christian; Fitzenberger, Bernd; Schönberg, Uta; Spitz-Oener, Alexandra

Working Paper

From Sick Man of Europe to Economic Superstar: Germany's Resurgent Economy

CRAM Discussion Paper Series, No. 06/14

Provided in Cooperation with:

Rockwool Foundation Berlin (RF Berlin)

Suggested Citation: Dustmann, Christian; Fitzenberger, Bernd; Schönberg, Uta; Spitz-Oener, Alexandra (2014) : From Sick Man of Europe to Economic Superstar: Germany's Resurgent Economy, CRAM Discussion Paper Series, No. 06/14, Centre for Research & Analysis of Migration (CRAM), Department of Economics, University College London, London

This Version is available at:

<https://hdl.handle.net/10419/295472>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



Centre for Research
and Analysis
of Migration

CRAM Labour

Discussion Paper Series

CDP No 06/14

From Sick Man of Europe to
Economic Superstar: Germany's
Resurgent Economy

*Christian Dustmann, Bernd Fitzenberger,
Uta Schönberg, Alexandra Spitz-Oener*

From Sick Man of Europe to Economic Superstar: Germany's Resurgent Economy[†]

Christian Dustmann, Bernd Fitzenberger,
Uta Schönberg, and Alexandra Spitz-Oener

In the late 1990s and into the early 2000s, Germany was often called “the sick man of Europe” (for example, *Economist* 2004), a phrase usually attributed to comments by Czar Nicholas I of Russia about the troubles faced by the Ottoman Empire in the mid-19th century. Indeed, Germany's economic growth averaged only about 1.2 percent per year from 1998 to 2005, including a recession in 2003, and unemployment rates rose from 9.2 percent in 1998 to 11.1 percent in 2005 (according to World Bank data). Today, after the Great Recession, Germany is described as an “economic superstar” (for example, in the movie “Made in Germany: Europe's Economic Superstar,” <http://films.com/ItemDetails.aspx?TitleId=29218>). Germany's number of total unemployed fell from 5 million in 2005 to about 3 million in 2008, and its unemployment rate had declined to 7.7 percent in 2010 (according to data from Germany's Federal Employment Agency, the Bundesagentur für Arbeit). In contrast to most of its European neighbors and the United States, Germany experienced almost no increase in unemployment during the Great Recession, despite a sharp decline in GDP in 2008 and 2009 (an episode discussed

■ *Christian Dustmann is Professor of Economics, University College London, London, United Kingdom. Bernd Fitzenberger is Professor of Statistics and Econometrics, University of Freiburg, Freiburg, Germany. Uta Schönberg is Associate Professor of Economics, University College London, London, United Kingdom. Alexandra Spitz-Oener is Professor of Economics, Humboldt University Berlin, Berlin, Germany. Fitzenberger is also Research Associate at ZEW Mannheim, and Schönberg and Spitz-Oener are also Research Associates at the IAB, Nuremberg, Germany. Their email addresses are c.dustmann@ucl.ac.uk, bernd.fitzenberger@vwl.uni-freiburg.de, u.schoenberg@ucl.ac.uk, and alexandra.spitz-oener@wiwi.hu-berlin.de.*

[†]To access the Appendix, visit <http://dx.doi.org/10.1257/jep.28.1.167>

in Möller 2010; Burda and Hunt 2011). Germany's exports reached an all-time record of \$1.738 trillion in 2011, which is roughly equal to half of Germany's GDP, or 7.7 percent of world exports. Even the euro crisis seems not to have been able to stop Germany's strengthening economy and employment.

How did Germany, with the fourth-largest GDP in the world (after the United States, China, and Japan) transform itself from "the sick man of Europe" to an "economic superstar" in less than a decade? One common answer points to a series of legislative labor market reforms that started in the mid 2000s, the so-called "Hartz reforms." Another explanation focuses on the evolution of Germany's economy and trade balance in the context of the eurozone. However, we will argue that these factors did not play a decisive role for the transformation of the German economy, namely the restructuring of its labor market and the increase in competitiveness that has helped German exports. We instead present evidence that the specific governance structure of the German labor market institutions allowed them to react flexibly in a time of extraordinary economic circumstances, and that this distinctive characteristic of its labor market institutions has been the main reason for Germany's economic success over the last decade.¹

We begin by arguing that the evolution of Germany's per unit labor costs—that is, labor costs relative to productivity—in both the manufacturing sector and the other sectors in the economy has played an important role in the favorable evolution of German tradable manufacturing industry. We then investigate the mechanisms that allowed for wage restraints and the dramatic decrease in real wages at the lower end of the wage distribution.

The specific feature of the German system of industrial relations that we stress is that it is not rooted in legislation, but instead is laid out in contracts and mutual agreements between the three main actors in Germany: employer associations, trade unions, and works councils. The institutional setup of this system, which is dominated by industry-wide wage bargaining, remained basically unchanged. However, many indicators demonstrate that it did change in the way it operates. For example, the share of German workers covered by any kind of union agreement has sharply declined, and the number of firm-level deviations from industry-wide union agreements has sharply increased since the mid 1990s. Overall, these gradual changes within the system led to an unprecedented decentralization of the wage-setting process from the industry level to the firm level. Alternatively, one may refer to this process as an increasing localization of Germany's industrial relations.

The decentralization in wage setting in Germany is in contrast to many of its neighbors where the statutory minimum wage is often high (relative to productivity), where union wages and work hour regulations apply to all firms in the

¹ Our argument is similar in spirit to that of Carlin and Soskice (2008, 2009), who argue that it is restructuring by Germany's private sector, using traditional German institutions based on employer-worker cooperation, and not government labor market and welfare state reforms that are to be credited for the German recovery.

industry, and where institutional change therefore requires broad consensus along the political spectrum.

We then turn to a discussion of why Germany's labor market experience has been so distinctive within continental Europe. On the one side, the fall of the Berlin Wall in 1989 and the dramatic cost of reunification burdened the German economy in an unprecedented way, leading to a prolonged period of dismal macroeconomic performance. On the other side, it gave German employers access to neighboring East European countries that were formerly locked away behind the Iron Curtain, and that were characterized by low labor cost, yet stable institutions and political structures. These factors changed the power equilibrium between employer and employee associations and forced the latter to respond in a far more flexible way than many would ever have expected. Finally, we discuss the relationship between our analysis of the flexibility of Germany's labor market institutions and two other events: Germany's Hartz reforms of 2003 and the arrival of the euro in 1999.

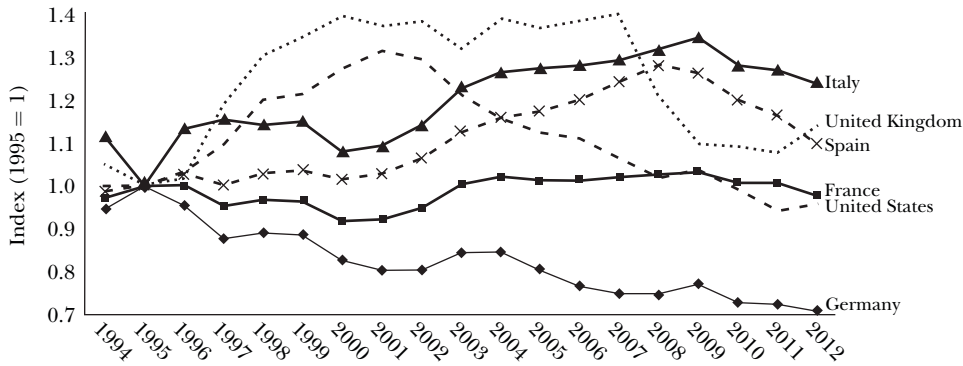
How Did Germany Improve its Competitiveness?

Relative Unit Labor Cost

In Figure 1, we plot the "relative unit labor costs" for a country's overall economy adjusted for the changing composition of the markets in which it competes, for a selection of countries, in dollar terms. This index is computed by the OECD based on year-to-year changes of unit labor costs and shows the relative change in the unit labor costs over time (normalized to 1995) translated into US dollars at the current exchange rate compared to a weighted average of a country's trading partners. The weights of the trading partners adjust annually to changes in trading patterns. An increase in this index indicates a deterioration of the competitive position. A drop in this index—that is, an improvement in competitiveness—is caused by some combination of three factors: 1) a decrease in the wage per worker (or per hour); 2) an increase in productivity (per worker or per hour); and 3) a nominal depreciation of a country's foreign exchange rate.

Since 1995, Germany's competitive position has persistently improved, while the competitiveness of some of its main European trading partners has deteriorated (Spain and Italy) or remained close to the 1995 position (France). The competitiveness of the United Kingdom has likewise deteriorated, although it improved dramatically between 2007 and 2009 due to the sharp depreciation of the British pound against other currencies. The US economy also lost competitiveness relative to Germany in the late 1990s as the US dollar appreciated in value relative to European currencies, but improved consistently after the 2001 recession, partly achieved through a dollar depreciation (for instance, while the euro/dollar exchange rate was around 1 in 2001, it had depreciated to 0.8 in 2009). However, Germany's gains in competitiveness with regard to France, Italy, and Spain cannot be due to currency depreciation (and in fact the euro appreciated relative to the currency of most trading partners), because these countries all share the euro, and so it must

Figure 1

Evolution of Competition-Weighted Relative Unit Labor Costs, Selected Countries, 1994–2012

Source: OECD Economic Indicators.

Notes: This index accumulates the annual change in the relative unit labor costs of country i compared to a weighted average of its main trading partners where labor costs are translated into dollars and the weights are adjusted annually to the change in trade pattern. The annual change in logs is calculated as $\Delta \log(RULC_{it}) = \Delta \log(ULC_{it} e_{it}) - \sum_{j \neq i} g_{ij}^{t-1} \Delta \log(ULC_{jt} e_{jt})$ where $ULC_{it} = (w_{it} L_{it}) / Y_{it}$ is the unit labor cost for country i in period t , computed as the total wage bill $w_{it} L_{it}$ divided by the value added of the country's industry Y_{it} . The unit labor costs are translated into US dollars using the exchange rate e_{it} . Both the unit labor costs and the exchange rates are defined as index relative to some base year. The weighting scheme g_{ij}^{t-1} takes account of the structure of competition in both export and import markets of the goods sector of those countries, and it adjusts on a year-by-year basis. See OECD *Economic Outlook* (2012, Issue 2, No. 92) and OECD Economic Outlook Sources and Methods (<http://www.oecd.org/eco/sources-and-methods>) for details on the method of calculation.

have arisen because German wages grew at a slower pace than productivity relative to these other eurozone countries.

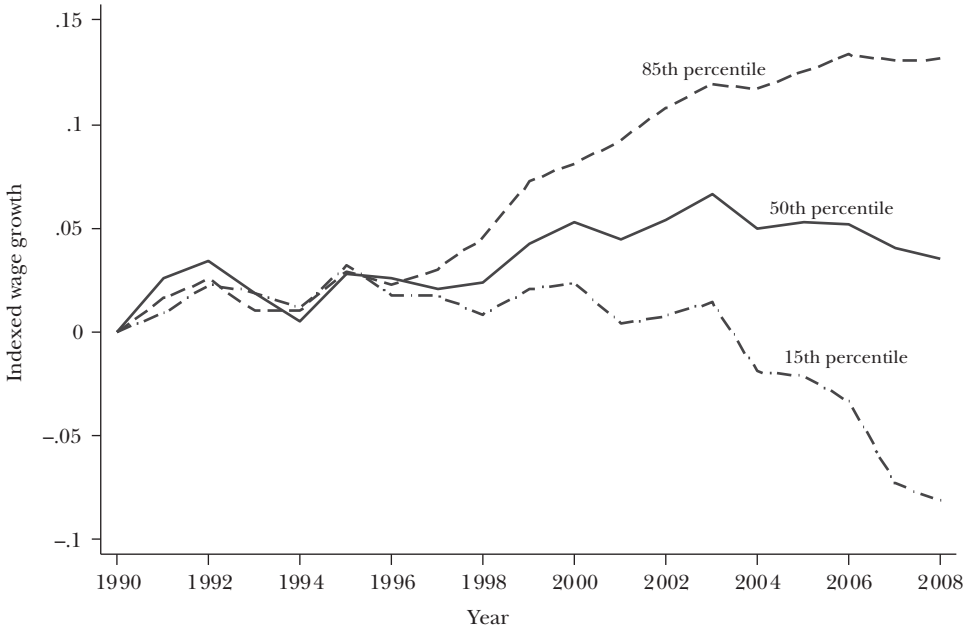
Wage Trends and Wage Inequality

Figure 2 shows the evolution of real wages in West Germany since 1990. The figure illustrates the dramatic development in wage inequality in West Germany over the past 15 years or so (Dustmann, Ludsteck, and Schönberg 2009; see also Antonczyk, Fitzenberger, and Sommerfeld 2010; Card, Heining, and Kline 2013).² Real wages at the 15th percentile fell dramatically from the mid 1990s onwards. From the early 2000s onwards, median real wages started to fall, and only wages at the top of the distribution continued to rise. Notice that all wage figures that we report stand for West Germany (although, henceforth, we refer to them as “Germany”), because developments in East Germany are strongly affected by the transition after German unification.

² Details on the wage data are in Appendix A available online with this journal at <http://e-jep.org>.

Figure 2

Indexed Wage Growth of the 15th, 50th, 85th Percentiles, West Germany, 1990–2008



Notes: Calculations based on SIAB Sample for West German Full-Time Workers between 20 and 60 years of age. The figure shows the indexed (log) real wage growth of the 15th, 50th, and 85th percentiles of the wage distribution, with 1990 as the base year. Nominal wages are deflated using the consumer price index (1995 = 100) provided by the German Federal Statistical Office.

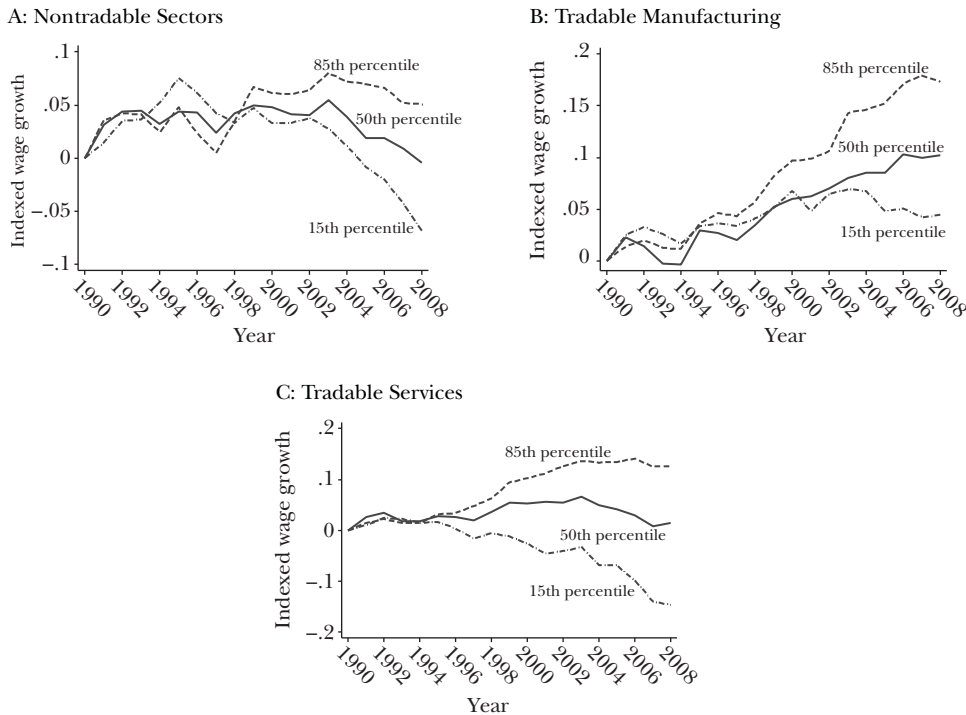
If the increase in wage inequality and the modest growth in wages overall—and in particular the dramatic decline in real wages at the bottom of the wage distribution—has contributed to the favorable evolution of unit labor costs in Germany relative to the United States and other eurozone countries, then one should expect this development to have been particularly pronounced in the tradable manufacturing sector—the backbone of the German exporting industries accounting for 80 percent of German exports. This insight turns out to hold true, but in an unexpected way.

To further explore the increase in wage inequality, we classify sectors with export volumes below the 25th percentile of the distribution of export volumes in 1995 as “nontradable sectors,” and those with export volumes above this threshold as “tradable sectors.” “Tradable manufacturing” are all those tradable sectors that belong to the manufacturing sector, and “tradable services” are all other tradable sectors.³ Figure 3 breaks down the evolution of real wages along the wage

³ Details on the construction of these categories can be found in Appendix A, available with this paper at <http://e-jep.org>.

Figure 3

Indexed Wage Growth of the 15th, 50th, 85th Percentiles, West Germany, by Sectors, 1990–2008



Notes: Calculations based on SIAB Sample for West German Full-Time Workers between 20 and 60 years of age. The figures show the indexed (log) real wage growth of the 15th, 50th, and 85th percentiles of the wage distribution, with 1990 as the base year. Nominal wages are deflated using the consumer price index (1995 = 100) provided by the German Federal Statistical Office. Panel A shows the evolution of these figures for the nontradable sectors, panel B for tradable manufacturing, and panel C for tradable services. We classify sectors with export volumes below the 25th percentile of the distribution of export volumes in 1995 as “nontradable sectors”, and those with export volumes above this threshold and that belong to the manufacturing sector as “tradable manufacturing.” The sectors above this threshold that do not belong to the manufacturing sector are classified as “tradable services.”

distribution separately for the nontradable sector, tradable manufacturing sector (henceforth denoted as manufacturing), and tradable services sector. By this measure, real wages in the manufacturing sector rose at all percentiles of the wage distribution until the mid 2000s and afterwards continued to rise at the median and the 85th percentile. Germany’s real wages in the nontradable sector hardly increased at all at any part of the wage distribution during the 1990s and started to decline from the early 2000s onwards even at the 85th percentile, but particularly so at the 15th percentile. The sharpest increase in inequality occurred in the tradable service sector, where between 1990 and 2008 real wages did not show an increase at the median, increased by 12 percent at the 85th percentile and declined by almost

15 percent at the 15th percentile. At first glance, these figures do not seem to lend support to the hypothesis that wage restraint in the manufacturing sector was an important factor in improving competitiveness in that sector.

Exports, Tradable Manufacturing, and Domestic Inputs

The end product in manufacturing, however, contains a large share of inputs produced in other sectors: in Germany, the value added in manufacturing is only roughly one-third of the value of the end product, with the remainder of value added being contributed through inputs from other industries, either domestically or from abroad (the literature so far has focused on Germany's imports of intermediate products from abroad, see Geishecker 2006; Sinn 2006; OECD 2007, chap. 3; OECD 2012, chap. 3). Hence, the manufacturing sector may have benefited from low wages in other domestic sectors and from cheap imports from abroad. In addition, Germany's manufacturing sector may have experienced increases in productivity which exceeded the increases in wages in the manufacturing sector.

More detailed evidence suggests that both of these factors may be at play.⁴ In Germany, the manufacturing sector comprised 21.6 percent of all jobs in 1995, but 17.7 percent of all jobs in 2007, while the value added of this sector (in current prices) remained essentially unchanged at 22.8 percent of all value added in 1995 compared with 22.7 percent of value added in 2007. This pattern suggests larger productivity increases in the manufacturing sector than in the other sectors, where employment shares increased over the same period, with value added remaining roughly constant. This pattern is not uncommon across high-income countries.⁵ However, the share of manufacturing in output value (value of final products), as opposed to value added, rose steadily from 35 percent of all output in 1995 to 39.3 percent of all output in 2007. This pattern reflects that the manufacturing sector indeed relies to an increasing extent on inputs from other domestic sectors and on imported inputs (because the share in final products has increased while the share in value added has remained the same), and may thus have benefited from the low wage growth in other domestic sectors and from cheaper imports.

Digging down into the more detailed data, shown in Table 1, the value of inputs over the value of output is nearly twice as high in manufacturing as in the other two sectors (66.1 percent in 1995 versus 37.8 percent in the tradable service sector) and this share increased by about 7 percentage points to 72.9 percent in 2007. The share of domestic inputs remained constant over the same period at about 51 percent. Thus, the increase in the share of inputs used by Germany's manufacturing sector, relative to the output value in that sector, is driven by increased

⁴ See Table 1 and Table A1 in Appendix C available online with this paper at <http://e-jep.org> for details and data sources.

⁵ Pilat, Cimper, Olsen, and Webb (2006) point out that the relatively fast productivity growth in manufacturing is associated with relative declines of the prices for manufacturing products (this is Baumol's cost disease). Thus, shares in value added at current prices understate the share of value added at constant prices in manufacturing to total value added at constant prices, which makes it remarkable that manufacturing in Germany has retained its share in value added at current prices.

Table 1

Evolution of the Share of Value of Total Inputs and Domestic Inputs over the Value of Output, Overall and by Sector, 1995–2007

	<i>Overall</i>	<i>Nontradable sectors</i>	<i>Tradable manufacturing</i>	<i>Tradable services</i>
Panel A: Value of Total Inputs/Output Value				
1995	48.2%	39.9%	66.1%	37.9%
2000	51.0%	37.9%	70.1%	41.4%
2007	53.2%	38.2%	72.9%	41.6%
Panel B: Value of Domestic Inputs/Output Value				
1995	39.8%	35.3%	51.7%	32.4%
2000	40.3%	32.2%	51.7%	34.8%
2007	40.5%	32.1%	51.2%	34.2%
Panel C: Value of Domestic Inputs/Value of Total Inputs				
1995	82.6%	88.3%	78.1%	85.6%
2000	79.0%	84.9%	73.7%	84.0%
2007	76.1%	83.9%	70.3%	82.2%

Notes: Calculations based on input-output statistics from the German Statistical Office (Fachserie 18, Reihe 2, Years: 1995–2007). We classify sectors with export volumes below the 25th percentile of the distribution of export volumes in 1995 as “nontradable sectors” and those with export volumes above this threshold and that belong to the manufacturing sector as “tradable manufacturing.” The sectors above this threshold that do not belong to the manufacturing sector are classified as “tradable services.”

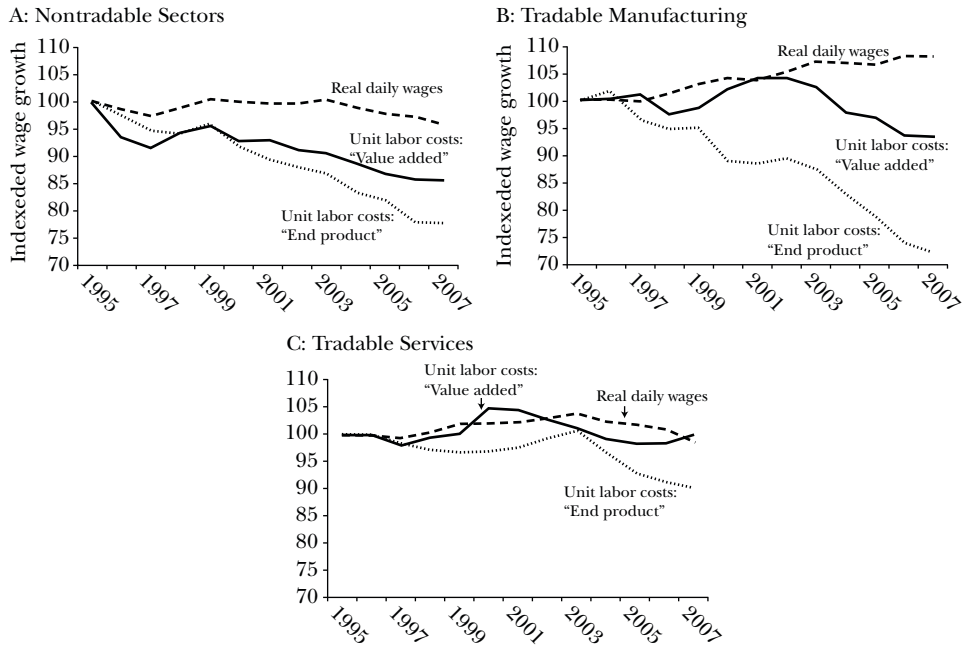
use of inputs from abroad relative to inputs from domestic industries. However, even in 2007, 70 percent of overall inputs in Germany’s manufacturing sector were domestically produced. Thus, the argument that Germany’s manufacturing sector has become nothing more than an assembly place for foreign produced inputs (for example, Sinn 2006) is unjustified. In fact, while German manufacturing has made increasing use of imported inputs, the share of domestic inputs in manufacturing final output value had remained high and relatively stable between 1995 and 2007.

To what extent have Germany’s domestic inputs contributed to competitiveness in its export-oriented manufacturing sector and the two other sectors? In Figure 4, we plot the evolution of unit labor costs in the three sectors, where industries are weighted with respect to their exports for the two tradable sectors.⁶ When computing unit labor costs, we first consider only the value added in the sector, as denoted by solid lines in Figure 4. We then consider final output value in the sector, which is the sum of value added in the sector and all inputs into the sector denoted by dotted lines in Figure 4. This index (Unit Labor Costs: “End Products”) incorporates gains in competitiveness in a sector due to the usage of inputs from other domestic sectors. We also plot median real wages, adjusted using Germany’s Consumer Price Index, for the three sectors. While real wage growth in the manufacturing sector is relatively modest,

⁶ Details on how unit labor costs are calculated can be found in Appendix A and in Appendix C, which are available online with this article at <http://e-jep.org>.

Figure 4

Evolution of Real Daily Wages and Unit Labor Costs by Sector, 1995–2007



Notes: The figures show indexed real mean daily wages by sector (base year 1995 = 100). Nominal wages are deflated using the consumer price index (1995 = 100) provided by the German Federal Statistical Office. The data underlying these indices are in columns (1), (4), and (7) of Table A2. The figure also shows indexed unit labor costs both “Value added” and “End product” by sector. The data underlying these indices are in columns (2), (3), (5), (6), (8), and (9) of Table A2 of the online Appendix. Table A2 includes a detailed description of data and methods of calculations.

at about 8.2 percent over the 11-year period, in the other two sectors average wages fell in real terms by 1.2 and 4.1 percent, respectively, over this time period.

As visible in the figure, domestic unit labor cost for total production in manufacturing, taking account of inputs produced in other sectors (“end products”), declined far more rapidly than unit labor costs in value added—a decline that cannot be explained by the increase in the share of imported inputs in total output value. Moreover, unit labor costs in end products start to decline at the start of the observation period in 1995, while unit labor costs in value added decrease rapidly only from 2003 onwards when mean wages, and in particular wages at the 15th percentile of the wage distribution start to decrease in real terms (as shown earlier in Figure 3).

Thus, Germany’s manufacturing sector improved competitiveness in several ways. First, manufacturing drew on inputs from domestically provided nontradable and especially tradable services, where real wages fell between 1995 and 2007. Second, the decline in unit labor costs, coupled with the increase in mean real wages in manufacturing, implies that productivity increases in the manufacturing sector have

outpaced wage increases in that sector. In comparison, total unit labor costs fell less in the nontradable sectors (minus 22.2 percent) and much less in the tradable services (minus 9.7 percent), even though nominal wages grew much less in these two sectors compared to tradable manufacturing. Note also that productivity increases in the manufacturing sector have exceeded the increases in the two other sectors. Finally, to increase the competitiveness of its own final products, the manufacturing sector has made increased use of trade integration with Eastern European countries through inputs imported from abroad, and far more so than other European countries. These inputs made up 14.5 percent of total output in the manufacturing sector in 1995 and 21.5 percent in 2007. Calculating the outsourcing indicator suggested by Egger and Egger (2003, p. 642) for Germany, France, and Italy regarding imported inputs from Poland, Hungary, and the Czech and the Slovak Republics, using data from the OECD Input-Output-Tables (at <http://www.oecd.org/trade/input-outputtables.htm>) and OECD International Trade and Balance of Payments Statistics (at <http://www.oecd.org/std/its/>), shows that in the year 2000, imported inputs from these four countries amounted to about 8.5 percent of inputs in Germany, compared to 2.5 percent in Italy and 1.9 percent in France (relative to GDP).

The Increase in Competitiveness and Germany's Labor Market Institutions

The movements in German wages, within and across sectors, belie the common belief that Germany's labor market institutions are overly rigid. Instead, we argue that the specific governance structure of the German system of industrial relations offers various margins of flexibility. In the early to mid 1990s, these institutions allowed for an unprecedented increase in the decentralization (localization) of the process that sets wages, hours, and other aspects of working conditions, from the industry- and region-wide level to the level of the single firm or even the single worker, which in particular helped to bring down wages at the lower end of the wage distribution. This decentralization took place even though the institutional setup of the dominating system of industry-wide wage bargaining basically remained unchanged.

The specific feature which we stress here is that the governance structure of the German system of industrial relations is not rooted in legislation and is not governed by the political process, but instead is laid out in contracts and mutual agreements between the three main labor market parties: trade unions, employer associations, and works councils (the worker representatives who are typically present in medium-sized and large firms).⁷ For this reason, Germany was in the position to react in an unprecedented way to the challenges of the early 1990s.

⁷ Works councils have to be set up in establishments with more than five employees when demanded so by the employees. About 92 percent of employees in establishments that have more than 50 employees work in establishments with a works council, but only 18 percent of employees in establishments that are smaller (Addison, Schnabel, and Wagner 1997; Beckmann, Föhr, and Kräkel 2010).

The principle of autonomy of wage bargaining is laid down in the German constitution and implies that negotiations take place without the government directly exerting influence. As such, Germany has had no statutory minimum wage imposed by the political process over the period we study. Rather, an elaborate system of wage floors is negotiated periodically between trade unions and employer associations, typically at the industry and regional level.

This model of industrial relations has been very successful in Germany, where negotiation with unions and participation of work councils in decision-making processes are widely regarded as an important cornerstone in furthering common interests and even improving productivity. As a consequence, negotiations are usually far more consensus-based and less confrontational than in other countries. For example, Germany lost on average 11 days of work each year per 1,000 employees by strikes and lock-outs between 1991 and 1999, but only five days per 1,000 employees between 2000 and 2007. These figures for the earlier and later time period compare to 40 and 32 days per 1,000 employees in the United States, 30 and 30 days in the United Kingdom, 73 and 103 days in France, 158 and 93 days in Italy, and 220 and 164 days in Canada (Lesch 2009).

Germany's culture of common interest is dissimilar to the view about worker representations commonly held in the United States. A recent US example is the attempt of the management of the German company Volkswagen to introduce a works council at its Chattanooga plant in Tennessee. While the participation of works councils in management decisions is considered by Volkswagen as a cornerstone of successful firm policy that helps furthering common interests, Tennessee Governor Bill Haslam has been outspoken in opposing any union formation at the plant, fearing that it endangers the state's effort to attract investment (Greenhouse 2013). A key difference between US and German labor market institutions lies in the fact that a works council in Germany elected by the employees does not have to be a union representative (although in practice the majority of works councils are union representatives), while the installation of a works council in a US firm automatically involves the firm becoming unionized. Thus, works councils in Germany may act in greater independence from a union if the survival of their firm is at stake.

Unions and Employer Associations

In Germany, contractual agreements between unions and employer associations are negotiated either on the region-industry level or on the firm level. In addition to wages, working time regulations are an important component of the negotiations.

A distinguishing feature from US labor market institutions is that the recognition of trade unions in Germany is at the discretion of the firm, and union contracts cover only the workers in firms that recognize the relevant sectoral wage bargaining (union) contract—regardless of whether the worker is a union member (for discussion, see OECD 2004; Dustmann and Schoenberg 2009; Fitzenberger, Kohn, and Lembcke 2013). Also, German firms that once recognized the union contracts can later opt out at their own discretion. Even within union wage contracts negotiated at the industry level, there is scope for wage flexibility at the firm level through

so-called “opening” or “hardship” clauses, provided that workers’ representatives agree (for example, Hassel 1999; Hassel and Rehder 2001; Carlin and Soskice 2009; Brändle, Heinbach, and Meier 2011; Bispinck, Dribbusch, and Schulten 2010). After opting out of a collective agreement, firms still have to pay wages for the incumbent employees according to the collective agreement until a new agreement at the firm level has been reached, but they do not have to honor new negotiated wage increases and the firm need not follow the old collective agreements for new hires. Thus, over time a firm may be able to lower wage costs considerably by opting out of the union contract—provided its employees accepted this.

After 1995, there was indeed a dramatic decline in union coverage in Germany. This decline is almost entirely driven by a decline in industry-wide agreements.⁸ From 1995 to 2008, the share of employees covered by industry-wide agreements fell from 75 to 56 percent, while the share covered by firm-level agreements fell from 10.5 to 9 percent. The percentage of German workers that were not covered by an agreement in 1995–1997 was highest in the tradable services (22 percent), as compared to tradable manufacturing (9.8 percent) and nontradables (12 percent). By 2006–2007, noncoverage had sharply increased in all three sectors to 40, 27, and 32 percent in the tradable services, manufacturing, and nontradables respectively, and this share continued to rise. By 2010, according to the German Structure of Earnings Survey, 41 percent of all employees in firms with at least 10 employees in the sectors Manufacturing, Mining, and Services are not covered by any collective wage agreement (StaBu 2013).

Has this decrease in union coverage rates contributed to a reduction in wage growth and to an increase in inequality? We investigate this question in Figure 5, where we plot the observed changes in log real wages between 1995 and 2008 along the wage distribution. We also plot the counterfactual changes that would have occurred if unionization rates had remained at the same level as in 1995, using the reweighting approach developed in DiNardo, Fortin, and Lemieux (1996), which essentially reweights wages observed in 2008 with the odds-ratio that a worker with specific observed characteristics has been observed in the 2008-coverage-status in 1995 versus being observed in the 2008-coverage-status in 2008. Notice that this constructed counterfactual exercise is by no means “causal,” among other reasons because it ignores general equilibrium effects of de-unionization. The figure suggests that Germany’s wages in 2008 would have been higher if union coverage had remained the same as in 1995 throughout the entire wage distribution, but the difference is particularly large at the lower end of the wage distribution.

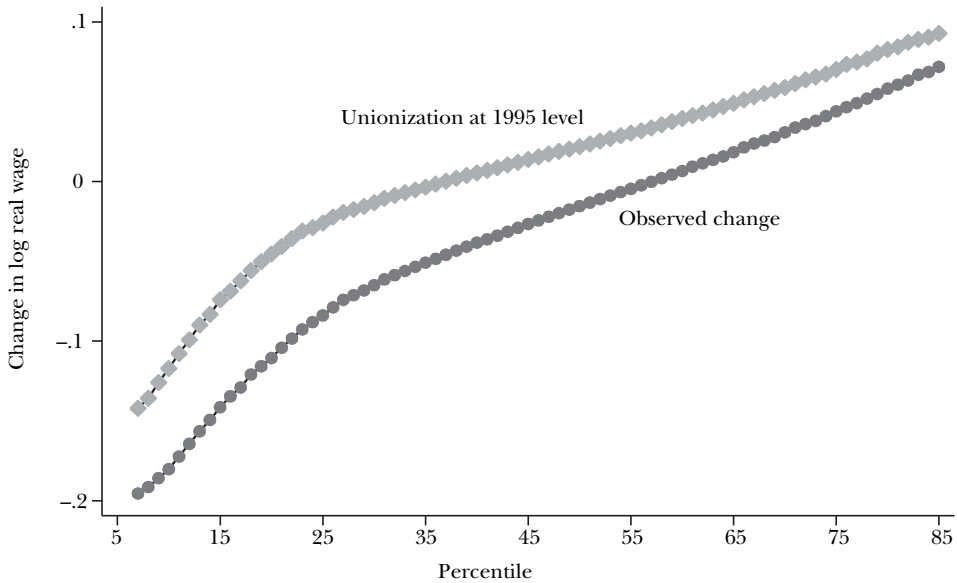
Works Councils and Opening Clauses

Wage inequality has also increased strongly among employees covered by union contracts, thus suggesting that the German system of industrial relations has allowed for wage adjustments even within the unionized sector. This pattern is illustrated in

⁸ See Data Appendix A and Table A3 in Appendix C, available online with the paper at <http://e-jep.org>.

Figure 5

Observed versus Counterfactual Wage Growth between 1995 and 2008 along the Wage Distribution: The Role of De-unionization

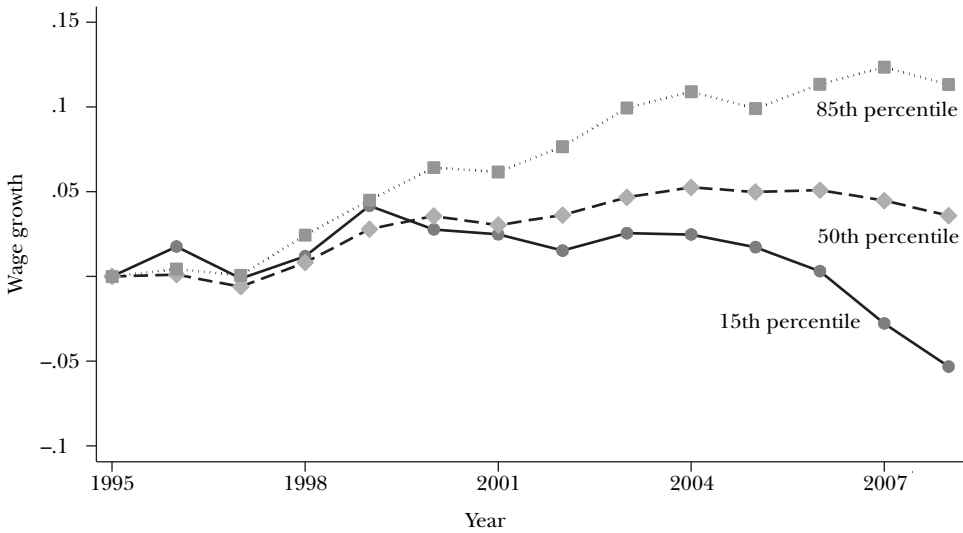


Notes: The figure shows the observed wage growth by percentile between 1995 and 2008, as well as the counterfactual wage growth which would have prevailed if the share of workers covered either by industry-wide or firm-wide agreements had remained at its 1995 level. The counterfactual wage distribution is computed using the reweighting approach developed by DiNardo, Fortin, and Lemieux (1996). Calculations are based in the LIAB.

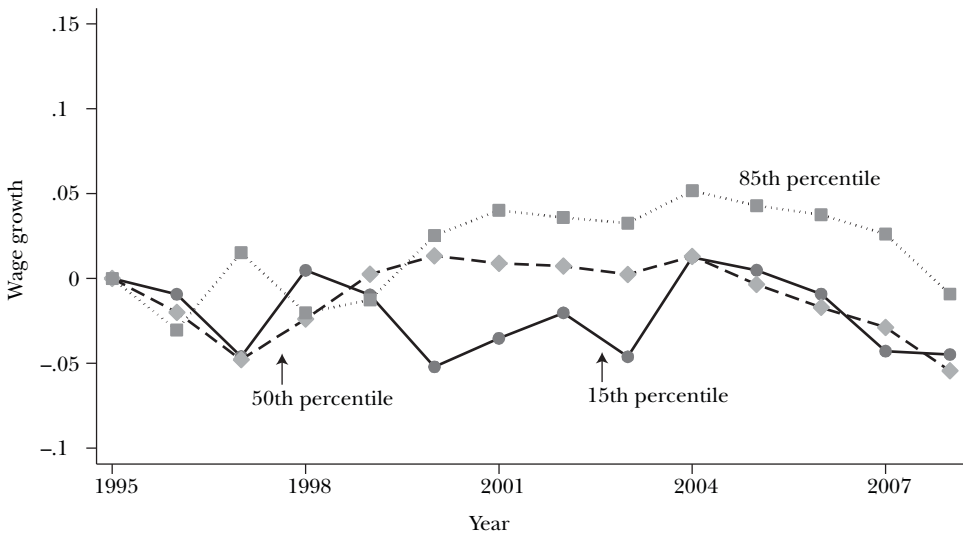
Figure 6, where we show the evolution of the 15th, 50th, and 85th percentile of the wage distributions, indexed at 0 in 1995, for those covered by a union (panel A) and uncovered by a union (panel B) sectors. The figure shows that wage inequality rose strongly in the covered sector both at the bottom and the top of the wage distribution, while in the uncovered sector it remained basically constant at the bottom of the wage distribution and only increased at the top of the wage distribution. However, notice that due to the indexation the figures hide the larger differentials in wage levels at specific percentiles in the uncovered sector relative to the covered sector: While the 85–50th and 50–15th differentials were on average 0.4 and 0.34 in the covered sector between 1995 and 2008, they were about 0.5 in the uncovered sector. Thus, three factors contributed to the rise in overall inequality during the time period under consideration, namely, the shift of workers from the covered to the uncovered sector (which led, due to the larger differences in wage levels in the uncovered sector, to an increase in lower tail inequality), the increase in inequality in the covered sector, and the increase in inequality at the top of the wage distribution in the uncovered sector.

Figure 6
Indexed Wage Growth of the 15th, 50th, 85th Percentiles, West Germany, by Union Coverage Status, 1995–2008

A: Covered Sector



B: Uncovered Sector



Notes: Calculations based on LIAB Sample for West German Full-Time Workers between 20 and 60 years of age. The figure shows the indexed (log) real wage growth of the 15th, 50th, and 85th percentiles of the wage distribution, with 1995 as the base year. Nominal wages are deflated using the consumer price index (1995 = 100) provided by the German Federal Statistical Office.

We think that the change in wage inequality in the covered sector is due to the decentralization of wage setting since the beginning of the 1990s, when industry-level collective bargaining came under increasing pressure from employers who demanded more firm-specific and differentiated regulations. Works councils accommodated this decentralization to secure jobs in Germany, which also strengthened their role in the industrial relations. As another response, the trade unions and employers' associations agreed on an increasing number of "opening clauses" in industry-level collective agreements. Opening clauses allow firms to deviate from collectively agreed industry-wide standards. At first, these opening clauses focused on hours of work, but later they also affected wages. Also, the opening clauses were initially only temporary to avoid bankruptcy, but later they were also implemented to ensure competitiveness in more general terms. Firms that use opening clauses negotiate the details concerning pay and working time agreements with the works council. Under German law, firms without a works council cannot use opening clauses, but such firms may instead decide to stop recognizing a union contract. Firms with a works council not covered by a union contract may reach an agreement on wages with the works council.

Brändle, Heinbach, and Meier (2011, Figure 1) report that opening clauses for wages only started to gain importance in 1995 (opening clauses regarding hours of work had existed before 1995). Among industry-wide collective contracts in manufacturing, less than 5 percent involved opening clauses for wages in 1995, but this had risen to about 60 percent in 2004. According to a survey of works councils in 2005, about 75 percent of all firms with collective agreements use opening clauses (Bispinck 2007; Bispinck, Dribbusch, and Schulten 2010).

To summarize, the specific governance structure of the German system of industrial relations allowed for an unprecedented increase in the decentralization of the wage setting process, leading to a decrease in real wages, in particular at the lower end of the wage distribution. This was driven by two main developments: 1) a sharp decline in the share of workers covered by union agreements; and 2) an increase in opening clauses that strengthened the role of firm-based works councils in wage determination relative to trade unions. This argument is consistent with the finding that the rise in firm-level differences in wages contributes strongly to the rise in wage inequality in Germany (Antonczyk, Fitzenberger, and Sommerfeld 2010; Card, Heining, and Kline 2013).

What Led to Greater Flexibility in the German Labor Market?

Why were wage restraints and decreasing real wages at the lower end of the wage distribution in Germany possible after the mid 1990s but not before? After all, German firms have always had the option not to recognize a union contract and to pay wages below the union wage, provided their employees accepted this. Opening clauses had been possible before the mid 1990s. Our answer traces to the major changes in Germany's economy in the early 1990s related to the

reunification of Germany and the opening up of the nearby central and eastern European economies.

On one hand, the extraordinary cost of German unification burdened the German economy in an unprecedented way, which is partly responsible for Germany's dismal performance throughout the 1990s and early 2000s. The German Council of Economic Experts (SVR 2004, table 100, p. 644) estimates net transfers of about 900 billion euros from former West Germany to East Germany during the time period 1991 to 2003. The total sum of net transfers corresponds to about half of one year's GDP in Germany during that time period. On the other hand, the opening of central and eastern European countries constituted a unique opportunity for German industry to move production abroad. They offered a stable investment climate, as well as (despite being locked away for several decades behind the Iron Curtain) a long history of trade and interaction with Germany. The structure of industry and education systems, for instance, shared many similarities, which survived the Soviet era. Vocational training plays a key role in the education system, in a way similar to Germany, in countries like Hungary or Poland. German was also widely spoken in parts of Central and Eastern Europe. At the same time, wages in these countries were far lower than in Germany, and working regulations more flexible (for example, Geishecker 2006; Marin 2006). Moving production abroad to these countries took place at a moderate pace: for example, the stock of German foreign direct investment to Poland, Hungary, as well as the Czech and the Slovak Republics amounted to about 1 percent of German GDP in 2000 and about 2.3 percent in 2010 (according to our calculations and data from http://stats.oecd.org/Index.aspx?DatasetCode=FDI_POSITION_PARTNER). However, the possibility that German firms might relocate production to these low-wage countries was very credible, and widely discussed in public (among German media outlets, see the articles in *DIHK* 2003; Mihm and Knop 2004; Hawranek, Hornig, and Jung 2004).

The fiscal burden of German reunification, coupled with an immediately more competitive global environment, made it increasingly costly for German firms to pay high union wages. The new opportunities to move production abroad, while remaining still nearby, changed the power equilibrium between trade unions and employer federations, and forced unions and/or works councils to accept deviations from industry-wide agreements which often resulted in lower wages for workers. In a similar vein, Burda (2000) predicted that the EU-accession of Eastern European countries would foster a reduction of labor market rigidities in the old EU member countries (including Germany). Germany's unions and works councils realized that they had to make concessions in order not to be further marginalized, and the specific characteristics of the German system of industrial institutions allowed the trade unions to adapt to the new economic realities and to make these concessions. As a result, the German labor market appeared to be far more flexible than many would ever have expected.

Why did other continental European countries not react in the same way as Germany? One important reason is that the particularly difficult economic situation in which Germany found itself in the early 1990s was to a large part specific to

Germany, due to the reunification of Germany, which was not felt in other European countries. This was reinforced by Germany's geographic vicinity to the countries of central and eastern Europe, which gave Germany an early taste of the challenges of globalization. This decade of economic stagnation and hardship, when Germany was the "sick man of Europe," prepared the population for accepting agreements for the sake of economic growth, which saw inequality rise dramatically for the first time in the after-war period.

In addition, the system of industrial relations in other continental European countries does not allow for the same inherent opportunities of flexible adaptation as the German system. For example, in countries like France and Italy, union wages are often bargained at the national level and apply to all firms in the economy, regardless of whether the firm explicitly recognizes the union contract. Coverage by union wage contracts has remained remarkably stable at very high levels at about 90 percent in France and 80 percent in Italy during the 1990s and the 2000s (OECD 2004, 2012; Visser 2013). Furthermore, in contrast to Germany, union wage contracts are typically extended to all workers in an industry (OECD 2004, table 3.4, p. 148; Visser 2013, table 4, pp. 96–98). In these and other continental European countries, adding flexibility into collective agreements would require political reforms at the national level. More generally, many of the regulations which are determined by labor contracts in Germany are either legally enforced in other countries (such as the minimum wage in France) or nationally implemented (for example, union agreements extend to all firms in the economy), and therefore require consent on a much higher level (nationally, or even on the political level) to be modified and changed. There is much less scope in these countries for a decentralization of wage setting (and other aspects of working conditions) within their system of industrial relations.

In general, the decentralization of union agreements is certainly being discussed more widely across Europe, but whether or when such changes might occur more widely remains uncertain.

Discussion and Outlook

We have argued that the remarkable transformation of the German economy from the "sick man of Europe" to a lean and highly competitive economy within little more than a decade is rooted in the inherent flexibility of the German system of industrial relations. This system allowed German industry to react appropriately and flexibly over time to the demands of German unification, and the global challenges of a new world economy. However, this intrinsic flexibility became only evident under the extraordinary difficult economic circumstances and the extreme duress in which Germany found itself in the decade after reunification. How does our thesis fit with two other possible explanations for Germany's increased competitiveness: Germany's Hartz labor market reforms of 2003, or the changes brought about by the adoption of the euro?

Germany's government under Gerhard Schröder implemented the so-called "Hartz Reforms" to the labor markets in 2003, which are often credited for spurring Germany's economy (for example, Rinne and Zimmermann 2012, 2013; see Fitzenberger 2009 for a critical assessment of the Hartz Reforms). These reforms were extremely controversial at the time. They reduced and limited the benefits while unemployed, liberalized agency work, reformed "active" labor market policies, and reorganized the Federal Labor Agency, but did not make any institutional changes in the wage setting process.

The Hartz reforms were implemented starting in 2003, hence nearly a decade after the process of wage decentralization and the improvement in competitiveness had begun in Germany. It seems plausible that the changes already underway in Germany's labor markets helped in preparing the political ground for the Hartz reforms. In addition, as the enumeration of the main components of the reforms makes clear, the scale of the reforms is modest enough that they seem unlikely to have triggered the dramatic increase in competitiveness or the enormous drop in German unemployment or to have led Germany's labor market through the deep recession in 2008–2009. Further, while the focus of the reforms was on creating incentives for seeking employment, they did little to support the remarkable wage restraint witnessed since the mid 1990s, which is the key factor in explaining the gain in competitiveness.

We therefore believe that while the Hartz reforms have contributed to the recent decline in long-term unemployment and to the continued increase in wage inequality at the lower end of the wage distribution, they were not central or essential in the process of improving the competitiveness of German industry. Moreover, although one sometimes hears the argument that other continental European countries should muster the political will to adopt their own version of the Hartz reforms, we believe that such a recommendation may be misleading. In our view, the specific governance structure of the German system of industrial relations—activated under extreme duress—is what paved the way for the remarkable decentralization of wage determination from the industry level to the level of the single firm or single worker, and which together with a significant increase in productivity ultimately improved Germany's competitiveness. Whether the political process would have been able to achieve a similar degree of wage decentralization, had the autonomy of wage bargaining not existed in Germany, is doubtful. In our view, the policy recommendation from Germany for the rest of continental Europe should not be the Hartz reforms (the advice given often by policymakers, as in a February 2013 speech by German Chancellor Angela Merkel reported in de Weck 2013), but reforms that would target the system of industrial relations by decentralizing bargaining to the firm level while keeping workers' representatives involved to secure that employees benefit again when economic conditions improve.

Some argue that the adoption of the common European currency is a main factor that has helped Germany to improve competitiveness. Again, we believe that the arrival of the euro may have been a contributing factor, but not the main one.

First, recall that Germany was shifting its labor market institutions and improving its competitiveness during the mid 1990s, and the euro did not start until 1999. Second, within the common currency area, and after 2001, Germany continued to gain competitiveness with respect to its main trading partners such as Italy and Spain. Third, the euro has persistently appreciated against the US dollar, leading to the increase in competitiveness of the United States as we illustrated in Figure 1. It seems unlikely that Germany's deutschemark (if the euro had not been introduced) would have appreciated much more against the dollar than the euro has, at least not before the start of the global financial crisis around 2008 and the ongoing European debt crisis. Finally, it is not clear whether an appreciation of a German currency (which probably would not have taken place before 2008) would have had a dramatic impact on Germany's overall competitiveness at least in the medium-term, because it would also have made imported inputs less costly and it would possibly have fostered even stronger labor market adjustments of the type we have described above. For example, the depreciation of the British pound by nearly 30 percent in 2008–2009 has done little to help UK manufacturing exports.

Of course, the existence of the common euro currency area raises a number of issues for countries within the eurozone. Without the possibility to depreciate national currencies, the only way for countries like France, Italy, and Spain to gain competitiveness relative to other countries of the eurozone is to reduce unit labor costs—that is, by increasing productivity relative to real wages. Whether these countries will succeed in this endeavor remains an open question. The more centralized and legally anchored nature of their labor market institutions, in comparison to Germany, does put them at a disadvantage in making such an adaptation. Boeri (2011) provides an assessment of the political economy of labor market reforms with a particular focus on countries of southern Europe. He argues that the political process often allows only for two-tier reforms (affecting only a subset of all employees) instead of complete reforms, which may not result in an increase of competitiveness.

The rise in inequality in Germany has led to an intensive debate about its social consequences, and its effect on poverty and social justice. For example, recent negotiations between employers and employee associations in Germany suggest that future wage settlements will try to make up for the loss in real wages many workers experienced in recent decades. It is also likely that certain aspects of labor and wage regulations will in the future be “put in legislative stone.” As one example, the new coalition government in Germany will introduce a nationally legislated minimum wage. Thus, the possibility for Germany to rely on its system of industrial relations to improve its competitive position by having a decentralized decision making process may be cut back, and this may restrict Germany's ability to react in similar ways to future economic challenges. If that occurs, then future gains in German competitiveness will need to be accomplished rather through increases in productivity that outstrip wage increases. This pattern may help to bring convergence in the competitiveness of the countries in the eurozone.

■ *Christian Dustmann is grateful for insightful and stimulating discussions with Wendy Carlin. We thank Wendy for comments on earlier drafts. We also benefited from excellent research assistance by Marina Furdas, Stefanie Licklederer, Olga Orlanski, and Florian Weiss. Bernd Fitzenberger dedicates his contribution for this paper to John Pencavel, his fabulous teacher in labor economics.*

References

- Addison, John T., Claus Schnabel, and Joaquim Wagner.** 1997. "On the Determinants of Mandatory Works Councils in Germany." *Industrial Relations* 36(4): 419–45.
- Antonczyk, Dirk, Bernd Fitzenberger, and Katrin Sommerfeld.** 2010. "Rising Wage Inequality, the Decline of Collective Bargaining, and the Gender Wage Gap." *Labour Economics* 17(5): 835–47.
- Beckmann, Michael, Sylvia Föhr, and Matthias Kräkel.** 2010. "Rent Seeking, Employment Security and Works Councils: Theory and Evidence for Germany." *Schmalenbach Business Review* 62(1): 2–40.
- Bispinck, Reinhard.** 2007. "Löhne, Tarifverhandlungen und Tarifsystem in Deutschland 1995–2005." WSI Discussion Paper No. 150, Wirtschafts- und Sozialwissenschaftliches Institut, Düsseldorf.
- Bispinck, Reinhard, Heiner Dribbusch, and Thorsten Schulten.** 2010. "German Collective Bargaining in a European Perspective: Continuous Erosion or Re-Stabilisation of Multi-Employer Agreements?" WSI Discussion Paper No. 171, Wirtschafts- und Sozialwissenschaftliches Institut, Düsseldorf.
- Boeri, Tito.** 2011. "Institutional Reforms and Dualism in European Labor Markets." Chap. 13 in Ashenfelter, Orley, and David Card, eds., *Handbook of Labor Economics*, Volume 4A and 4B. North Holland, Elsevier.
- Brandle, T., W. D. Heinbach, and M. F. Meier.** 2011. "Tarifliche Öffnung in Deutschland: Ausmaß, Determinanten, Auswirkungen." *Journal for Labour Market Research* 44(1–2): 163–72.
- Burda, Michael.** 2000. "Mehr Arbeitslose—der Preis für die Osterweiterung? Zur Auswirkung der EU-Osterweiterung auf die europäischen Arbeitsmärkte im Osten und Westen [More unemployment—the price of eastwards expansion? The impact of the eastwards expansion of the EU on European labor markets in the East and West]." *Duncker & Humblot, Serientitel: Schriften des Vereins für Socialpolitik Neue Folge* 274, 79–102.
- Burda, Michael, and Jennifer Hunt.** 2011. "What Explains the German Labor Market Miracle in the Great Recession?" *Brookings Papers on Economic Activity* 42(1): 273–335.
- Card, David, Joerg Heining, and Patrick Kline.** 2013. "Workplace Heterogeneity and the Rise of German Wage Inequality." *Quarterly Journal of Economics* 128(3): 967–1015.
- Carlin, Wendy.** 2012. "Real Exchange Rate Adjustment, Wage-setting Institutions, and Fiscal Stabilization Policy: Lessons of the Eurozone's First Decade." *CESifo Economic Studies* 59(3): 489–519.
- Carlin, Wendy, and David Soskice.** 2008. "Reforms, Macroeconomic Policy and Economic Performance in Germany." In *Economic Policy Proposals for Germany and Europe*, edited by Ronald Schettkat, and Jochem Langkau, 72–118. Routledge.
- Carlin, Wendy, and David Soskice.** 2009. "German Economic Performance: Disentangling the Role of Supply-side Reforms, Macroeconomic Policy and Coordinated Economy Institutions." *Socio-Economic Review* 7(1): 67–99.
- Dauth, Wolfgang, Sebastian Findeisen, and Jens Suedekum.** 2012. "The Rise of the East and the Far East: German Labor Markets and Trade Integration." IZA Discussion Paper No. 6685.
- de Weck, Joseph.** 2013. "Merkel Cites East

- German Lessons for EU's Problem States. *Bloomberg.com*. February 19. <http://www.bloomberg.com/news/2013-02-18/merkel-cites-east-german-lessons-for-crisis-wracked-euro-states.html>.
- DIHK [Deutscher Industrie- und Handelskammertag]**. 2003. "Produktionsverlagerung als Element der Globalisierungsstrategie von Unternehmen: Ergebnisse einer Unternehmensbefragung Mai 2003." ["Offshoring of Production as Part of the Globalization Strategy of Firms: Results of a Firm Survey in May 2003, Berlin."] <http://www.dihk.de/ressourcen/downloads/produktionsverlagerung.pdf>.
- DiNardo, John, Nicole Fortin, and Thomas Lemieux**. 1996. "Labor Market Institutions and the Distribution of Wages, 1973–1992: A Semiparametric Approach." *Econometrica* 64(5): 1001–1044.
- Dorner, Matthias, Jörg Heining, Peter Jacobebbinghaus, and Stephan Seth**. 2010. "Sample of Integrated Labour Market Biographies (SIAB) 1975–2008." FDZ-Datenreport 01/2010.
- Dustmann, Christian, and Uta Schönberg**. 2009. "Training and Union Wages." *Review of Economics and Statistics* 91(2): 363–76.
- Dustmann, Christian, Johannes Ludsteck, and Uta Schönberg**. 2009. "Revisiting the German Wage Structure." *Quarterly Journal of Economics* 124(2): 843–81.
- Economist**. 2004. "Germany on the Mend." November 17. <http://www.economist.com/node/3352024>.
- Egger, Harmut, and Peter Egger**. 2003. "Outsourcing and Skill Specific Employment in a Small Economy: Austria after the Fall of the Iron Curtain." *Oxford Economic Papers* 55(4): 625–43.
- Fitzenberger, Bernd**. 2009. "Nach der Reform ist vor der Reform? Eine arbeitsökonomische Analyse ausgewählter Aspekte der Hartz-Reformen." In *Reformen für Deutschland—Die wichtigsten Handlungsfelder aus ökonomischer Sicht*, edited by Günther Schulze pp. 21–48. Schäffer-Poeschel Verlag.
- Fitzenberger, Bernd, Karsten Kohn, and Alexander C. Lembcke**. 2013. "Union Density and Varieties of Coverage: The Anatomy of Union Wage Effects in Germany." *Industrial Labor Relations Review* 66(1): 169–97.
- Fitzenberger, Bernd, Karsten Kohn, and Qingwei Wang**. 2011. "The Erosion of Union Membership in Germany: Determinants, Densities, Decompositions." *Journal of Population Economics* 24(1): 141–65.
- Gartner, Hermann**. 2005. "The Imputation of Wages above the Contribution Limit with the German IAB Employment Sample." FDZ-Methodenreport 02/2005.
- Geishecker, Ingo**. 2006. "Does Outsourcing to Central and Eastern Europe really threaten Manual Workers' Jobs in Germany?" *World Economy* 29(5): 559–83.
- Greenhouse, Steven**. 2013. "VW and Its Workers Explore a Union at a Tennessee Plant." *New York Times*, September 6. <http://www.nytimes.com/2013/09/07/business/vw-and-auto-workers-explore-union-at-tennessee-plant.html>.
- Hassel, Anke**. 1999. "The Erosion of the German System of Industrial Relations." *British Journal of Industrial Relations* 37(3): 483–505.
- Hassel, Anke, and Britta Rehder**. 2001. "Institutional Change in the German Wage Bargaining System—The Role of Big Companies." MPIfG Working Paper 01/9.
- Hawranek, Dietmar, Frank Hornig, and Alexander Jung**. 2004. "Bye-bye 'Made in Germany.'" *Der Spiegel* 44: 94–109.
- Jacobebbinghaus, Peter, and Stephan Seth**. 2010. "Linked Employer-Employee Data from the IAB: LIAB Cross-sectional (Model 2, 1993-2008)." FDZ-Datenreport 05/2010.
- Lesch, Hagen**. 2009. "Erfassung und Entwicklung von Streiks in OECD-Ländern." *IW Trends*, 1/2009, Institut der deutschen Wirtschaft, Köln.
- Marin, Dalia**. 2006. "A New International Division of Labor in Europe: Outsourcing and Offshoring to Eastern Europe." *Journal of the European Economic Association* 4(2/3): 612–22.
- Mihm, Andreas, and Carsten Knop**. 2004. "Outsourcing: Bis ich mit der Gewerkschaft klar bin, hat die Konkurrenz schon geliefert [Outsourcing: Until I have reached an agreement with the union, the competitor has already delivered]." *FAZ [Frankfurter Allgemeine Zeitung]*, March 21. <http://www.faz.net/aktuell/wirtschaft/outsourcing-bis-ich-mit-der-gewerkschaft-klar-bin-hat-die-konkurrenz-schon-geliefert-1144367.html>.
- Möller, Joachim**. 2010. "The German Labor Market Response in the World Recession—De-mystifying a Miracle." *Journal for Labour Market Research* 42(4): 325–36.
- OECD**. 2004, 2007, 2012. *Employment Outlook*.
- Pilat, Dirk, Agnès Cimper, Karsten Olsen, and Colin Webb**. 2006. "The Changing Nature of Manufacturing in OECD Economies." OECD, STI Working Paper 2006/9.
- Rinne, Ulf, and Klaus F. Zimmermann**. 2012. "Another Economic Miracle? The German Labor Market and the Great Recession." *IZA Journal of Labor Policy* 1/3.
- Rinne, Ulf, and Klaus F. Zimmermann**. 2013. "Is Germany the North Star of Labor Market Policy?" *IMF Economic Review* 61(4): 702–729.
- Sinn, Hans-Werner**. 2006. "The Pathological Export Boom and the Bazaar Effect: How to Solve the German Puzzle." *World Economy* 29(9): 1157–75.

Spermann, Alexander. 2012. "The New Role of Temporary Agency Work in Germany." In *Die neue Rolle der Zeitarbeit in Deutschland, Beiträge zur Flexibilisierung* edited by Richarda B. Bouncken, Lutz Bellmann, and Manfred Bornewasser, Volume 3, 203–224. München and Mering.

StaBu [German Federal Statistical Office]. 2013. Verdienste und Arbeitskosten—Tarifbindung in Deutschland 2010. Statistisches Bundesamt, Wiesbaden. <https://www.destatis.de/DE/Publikationen/Thematisch/VerdiensteArbeitskosten/Tarifverdienste/Tarifbindung.html>.

Streeck, Wolfgang. 1997. "German Capitalism: Does It Exist? Can It Survive?" *New Political Economy* 2(2): 237–56.

SVR [German Council of Economic Experts]. 2004. "Erfolge im Ausland—Herausforderungen im Inland." Annual Report to the Government, Wiesbaden. http://www.sachverstaendigenrat-wirtschaft.de/fruehere_jahresgutachten.html.

Visser, Jelle. 2013. "Wage Bargaining Institutions from Crisis to Crisis." Economic Papers 488, European Commission. April. http://ec.europa.eu/economy_finance/publications/economic_paper/2013/ecp488_en.htm.