Chapter 2: Working Time Developments in Germany*

1. Introduction

During the last 30 years, the length of the standard work week has been a contentious topic in Germany. In the 1980s and the 1990s, trade unions reached agreements to reduce normal hours, in order to raise employment.[1] In this chapter, we will first give an overview of the institutional context and the development of normal hours worked in Germany (Section 2). Economists are typically skeptical about the effectiveness of a work-sharing policy (i.e. the concept of the redistribution of a given amount of work over more employees). One of the reasons is the corresponding rise in labor costs if employees are compensated by the fall in income through lower hours (see also the theoretical chapter of this part of the book). Section 3 provides a review of the econometric evidence for Germany on the impact of reductions in standard hours on employment and wages.

As is highlighted in Section 4, reductions in standard hours were accompanied by various forms of flexible working time arrangements. During the last couple of years, the public debate in Germany on working time has experienced a complete redirection. Employer associations demand an increase in standard hours to lower labor costs and to secure the international competitiveness of German companies. This, of course, is often confronted with the resistance of trade unions which claim that employers merely take advantage of the economic downturn in Germany to increase their profit situation. Section 5 describes some well-known examples of firms which have increased normal hours and simultaneously pronounced job guarantees. Union advocates, however, fear that longer hours generally increase unemployment, which is basically the analogy to the work-sharing argument mentioned above. Based on the IAB-Establishment Panel, Section 6 presents an empirical analysis on the relationship between changes in standard hours and employment (and labor productivity) growth. This is a first attempt to evaluate whether or not longer working hours have indeed stabilized employment or vice versa. Section 7 presents some concluding remarks.

* We thank Claus Schnabel for helpful comments on various issues.
[1] Synonyms throughout this chapter are normal working time, standard hours, normal hours and standard work week. They all denote the stipulated weekly working time and are in contrast to actual hours worked, which also include overtime hours.

2. Hours reductions in Germany

The working time law from 1938 set a maximum of 48 hours (including overtime) per week and eight hours per day, with a general ban on Sunday work. More recently, a new working time law (*Arbeitszeitgesetz*), introduced in 1994 to transpose the provisions of the EU working time directive from 1993 into national law, allows for a temporary extension of the working week up to 60 hours as long as the daily working time does not exceed 8 hours when averaged over six months.

However, these statutory provisions are often not binding, namely when working time relations are determined by collective bargaining. This takes place mainly at the regional industry-wide level with more than 1,100 bargaining branches, though agreements within an industry (across regions) are usually very similar. Collective bargaining may also be conducted between a union and a single employer at the company level.[2] Coverage by industry-wide agreements has fallen in recent years, though it is still much more important than firm-level bargaining. In 2004, approximately 41 (19) percent of Western (Eastern) German plants applied bargaining agreements from the industry level, but only 2.4 (4.0) percent were covered by company level agreements (own calculations with the IAB-Establishment Panel).[3] Since the incidence of unionization is positively related with firm size, the coverage rate of employees is much higher.[4] About 61 (41) percent of Western (Eastern) German employees work in companies covered by industry-wide bargaining, while firm level agreements apply for 7.1 (11.7) percent of the workforce.[5]

The metal and engineering workers' union (IG Metall), with 2.5 million members in 2005 the second biggest union in Germany, has played a dominant role in post-war bargaining.[6] In the metal-working industry, normal working time was reduced from 48 hours to 45 hours per week in 1956 and to 40 hours in 1967 (Bosch 1990). Given the rapid economic growth during this period, the cuts in normal working time were implemented without major economic dispute and were intended to enhance the quality of life. With other industries following these settlements several years later, by 1975 the prevailing conditions for full-time workers were six weeks of annual holidays and just above 40 hours per week (see also Figure 1).

[2] Well-known examples for agreements at the firm-level are Lufthansa, Siemens, Volkswagen, Deutsche Telekom or the oil companies.
[3] Various statistics and regressions reported throughout this chapter are based on the IAB-Establishment Panel. See Box 1 in the Appendix for a description of this data-set.
[4] Unlike in the US but as in France or most European countries, collective bargaining agreements apply in practice to all workers of a company, not only to union-members.
[5] These numbers have fallen considerably since 1996 when 69 (56) percent of Western (Eastern) German employees worked in companies covered by industry-wide bargaining and 11.1 (16.7) of the workforce was covered by firm-level agreements.
[6] IG Metall was by far the biggest union until 2001 when the five unions of the service sector merged into *ver.di*, which comprised at the end of 2003 about 2.6 million members (IWD, 08.01.2004, p. 2).

Given the rising unemployment in the seventies, in 1978-1979 IG Metall launched a campaign to reduce standard working time below 40 hours in order to promote work-sharing. While their attempts failed in the face of employers' strong resistance, they were more successful a few years later, when, after a seven-week strike in 1984, normal working time was reduced to 38.5 hours in 1985. This was followed by further agreements between IG Metall and Gesamtmetall (the metal and engineering employers' association) on reductions of standard hours to 37 hours in 1988, to 36 hours in 1993 and to 35 hours in 1995.

The IG Metall set a benchmark and some other industries, including the steel and printing sectors, followed the metal-working industry to reach the 35 hours level by 1995. The timber industry implemented a 35 hours week in 1997 and the paper industry did likewise in 1998. Other sectors also reduced standard working time, but not down to 35 hours: the chemical industry to 37.5 hours in 1993, the building industry to 39 hours in 1990, the textile and clothing industry to 37 in 1994 or the retail sector to 37.5 in 1991.[7,8]

The most prominent firm-level agreement on working time reductions has been the settlement between Volkswagen AG and IG Metall. Facing an economic recession in the early 1990s, the management intended to cut employment by 30,000 (out of 100,000) jobs. In November 1993, however, an agreement was reached on (i) a reduction in working time from 35 to 28.8 hours (ii) a reduction in the yearly gross income by 16 percent and (iii) no resort to redundancies until 1997.[9]

The development of standard hours as negotiated by collective bargaining between 1973 and 2004 is also displayed in Figure 1. For Western Germany, there is a downward trend between the mid-eighties and the mid-nineties, but before and afterwards bargained standard hours remain stable.[10] Negotiated standard working time is higher in Eastern Germany, where in 2004 the average standard working time amounts to 39 hours, as opposed to 37.35 in Western Germany. The gap has been reduced slightly from 2.2 hours in 1993 to 1.65 hours in 2004 since there was a (modest) fall of standard hours in Eastern Germany after 1995.

Standard hours which are actually applied in companies often deviate from the bargained standard hours

[7] All of these figures refer to Western Germany. Standard hours in the Eastern German metal industry, for example, were reduced to 39 in 1994 and to 38 in 1996.

[8] Reductions in working time were also achieved through the increase in annual holiday entitlements. In this chapter, we focus on the standard work week and ignore reductions in the yearly holidays. First of all, there is no information in the IAB-Establishment Panel. Second, the variation in the average number of vacation days is less important. For example, the average number of collectively agreed days rose in Western Germany between 1985 and 1998 from 29.0 to 29.5 (Müller-Jentsch & Ittermann, 2000).

[9] Unfortunately, there is no but anecdotal evidence on whether or not moonlighting increased, but Promberger et. al (1996) reported that 46 percent of Volkswagen's workforce desired either more hours or more work.

[10] Since the figure is aggregated over all industries, it obviously masks any differences between sectors. However, it should be noted that the depicted trend is not the outcome of a shift in the sectoral decomposition of the economy.

discussed above. First, about 30 (45) of the employees in Western (Eastern) Germany work under individual regulation (in contrast to collective bargaining). Second, there is an increasing level of working time flexibility at the company level (see below). Figure 3 shows the development of standard hours between 1995 and 2004 as measured at the company level, separately for the three bargaining regimes (none, industry level, firm level) and for Western and Eastern Germany.[11] As expected, standard hours are highest for plants not applying any bargaining agreement. In 2004, they exceeded the average standard work week in plants with a bargaining agreement from the industry level by one (a half) hour in Western (Eastern) Germany. Hence, the difference is not very large and, in addition, within Eastern and Western Germany the movement of standard hours is almost parallel between both bargaining types. This clearly indicates that plants with individual contracts have working time regulations that resemble to a considerable degree those adopted in collective agreements.

Standard hours have fallen slightly in Eastern Germany. This is consistent with Figure 1 and due to the fact that after 1995 there were occasional reductions in bargained standard hours in the East. In Western Germany, by contrast, standard hours in plants with bargaining agreements applied from the industry level have slightly gone up between 1997 and 2004. The rise is only modest and amounts to about a quarter of an hour, but stands in contrast with Figure 1. Evidently, some companies made use of the possibility to deviate from collectively agreed working time standards under certain circumstances. Standard working time in plants with a firm-level agreement in the East is very close to industry-wide arrangements, whereas in 2004 in the West, it is about half an hour lower than hours worked in plants with industry-level contracts.

Figure 4 depicts the dispersion of standard hours, measured at the company level, again stratified by bargaining regime and by region. These statistics are calculated using controls for industry and firm size (separately for each year, each bargaining regime and for Eastern and Western Germany) to remove the effect of a different sector and size structure between the bargaining regimes (and between Western and Eastern Germany). The following tendencies clearly appear: (i) The variation is largest for Western German plants without a bargaining contract. (ii) By 2004, the variation for the other five groups is literally identical. (iii) The deviation rises for Western German plants applying an industry-level agreement. This comes from the fact that more companies make use of the opting-out possibility (see below). For Eastern German plants with an industry-wide agreement, the series shows only an upward trend since 1999. (iv) The depicted series fluctuate most for plants with a firm-level agreement, a potential reflection of a lower sample size.

The (between-plant) dispersion of standard hours and its difference between Eastern and Western Germany can

[11] These figures are based on own calculations with the IAB-Establishment Panel. Unfortunately, the data-set does not contain information on standard hours in 2000 and 2003. The Establishment Panel starts in 1993 (1996) for Western (Eastern) Germany, but information on the bargaining regime is available only from 1995 onwards.

also be seen from Table 1, which reports the distribution of normal hours across employees. While the standard work week amounts to 40 hours for 70 percent of the workers in the East, this is only the case for one out of four workers in the West. However, almost every second employee works between 37.5 and 38.5 hours in Western Germany, but only thirteen percent of the workers in Eastern Germany. Finally, it is often assumed that the 35-hour work week predominates in Germany, but Table 1 shows that this only holds for ten percent of the employees in Western Germany, and only for a minority of 1.3 percent of the Eastern German workforce.

Actual hours worked may also differ from bargained standard hours due to the use of overtime. Figure 2 shows that there has been a downward trend in paid overtime hours between 1970 and the beginning of the nineties, after which they remained fairly stable in Western Germany. At least from these aggregated statistics, there is no apparent substitution towards more overtime after the reduction in the standard work week. On average, a West German full-time employee works only slightly more than one paid overtime hour per week. This is much lower than in the U.S. or the United Kingdom, for example. East German employees work even less overtime, presumably because of a higher standard working time as well as because of the deteriorated economic situation.

While aggregate statistics for bargained standard hours are remarkably stable for Western Germany and fall only slightly for Eastern Germany between 1996 and 2004 (see Figure 1), we do observe significant changes in standard working time at the company level. On average, between two consecutive waves of the IAB-Establishment Panel, 14.3 (13.2) percent of the Western German plants increased (lowered) their standard hours. The respective numbers are a bit lower for the sample of Eastern German plants, but still amount to 10.2 (7.2) percent. There is also a considerable proportion of companies changing their bargaining regime. 16 (19) percent of Western (Eastern) German plant-year observations report a different bargaining status than in the previous survey.

To investigate the relationship between adjustments in standard working time and changes in the bargaining regime, we have run a basic OLS regression with the change in standard hours as the dependent variable and the bargaining regime in the current and in the previous year on the right-hand-side. Since three different bargaining status (none, industry-level and firm-level) exist, there are nine possible transitions between two years, which are all (but one) included as dummy variables. We also added a variable indicating the existence of a works council and year dummies.[12] We have investigated the relationship separately for Western and Eastern Germany, both with and without weights. The results are reported in Table 2.

First of all, changes in standard working time implemented at the company-level remain almost fully unexplained. Second, within-company changes in standard hours do not differ between plants which apply an

[12] Dummies for sectoral affiliation and firm size have been dropped since both groups turned out to be insignificant.

industry-level agreement in two consecutive survey waves and those plants which are without a bargaining agreement in both years. This is consistent with Figure 3, which shows an almost identical development between both plant-types. Third, and most interestingly, plants without a bargaining contract which have left an industry-wide agreement in the previous year, have increased their standard hours since then. The coefficients from the weighted regressions imply that the difference in working time between these plants and companies which kept their industry-wide contract rose by 33 (14) minutes in Western (Eastern) Germany. Fourth, the existence of a works council hardly influences the development of standard hours within a plant. Its coefficient is (weakly) significant only in the weighted regressions, but even there the implied effect amounts to a few minutes.

3. The impact of reductions in standard hours on employment and wages in Germany: Empirical Evidence

German trade unions achieved reductions in standard working time since the mid-eighties, aiming to induce work-sharing. As has been outlined in the theory chapter, the success of such a policy also depends on the wage compensation mechanism, on potential adjustments in labor productivity following a cut in standard hours, as well as on the objectives of the unions.

Hunt (1999, p. 118) noted with respect to the impact of standard hours reductions that in Germany "…it is generally believed that employment rose, despite an almost total absence of econometric evidence." Instead, the existing (pro work-sharing) evidence was generally based on case-studies, surveys of firms, macro-economic simulations or component calculations (decomposing *ex post* changes in production into three components: hourly productivity, employment and hours of work).[13] This section provides a summary of the econometric evidence on the effects of standard hours reductions in Germany.

A precondition for work-sharing to work is that firms do not expand overtime to off-set the reduction in standard hours. This seems to be of a smaller problem in Germany, however. For example, Hunt (1999) finds with individual-level data from the GSOEP, 1984-1994, that a one-hour-reduction in standard hours has reduced actual hours for hourly-paid workers (*Arbeiter*) in the production sector between 0.88 and 1 hour. Hence, overtime hours have increased by at most 7 minutes.[14,15]

[13] See Feil & Schröder (2002) for an extensive survey or, for an early review, Seifert (1991).
[14] It should be noted that Hunt uses industry-wide standard hours obtained from collective bargaining agreements, either as an instrument or, in separate regressions at the industry-level, as a right-hand-side variable. Since the latter delivers almost identical estimates, there is no evidence that Hunt's findings are flawed because of the endogeneity of her standard hours measure.

German unions have usually claimed to have achieved full wage compensation (*Lohnausgleich*), but Hunt (1999) notes that it is not clear what is implied by this term. The confusion arises because no account is taken of how much hourly wages would have been increased (due to productivity improvements) if there were no reductions in normal working time. Nevertheless, all empirical studies have found wage compensation, although there is some variation in its degree.

Hunt (1999), the most cited empirical evidence on the effects of standard hours reductions in Germany, inspects the impact of different measures of overtime to calculate the hourly wage rate.[16] She finds almost full wage compensation, with estimates of −0.78 for salaried employees and of −0.87 for hourly paid workers. Using industry-level data, Steiner & Peters (2000) obtain very similar estimates. Franz & Smolny (1994) find wage compensation for some industries (car industry, machinery and equipment, electrical equipment) and no effect for others. However, the authors point out that, for some industries, there were only few reductions in negotiated working time during the sample period, hence the insignificant coefficient on standard hours in these cases.

The findings of Hunt are confirmed with plant-level data from the IAB-Establishment Panel by Schank (2006). His results imply full income compensation for plants applying a bargaining agreement. This outcome does not depend on the level of collective bargaining (industry or firm level).[17] Wages in plants without a bargaining agreement did also respond to changes in standard working time, but as expected to a smaller extent (with an elasticity of about -0.5). To summarize, the empirical evidence indicates that unions have achieved their goal of (near full) wage compensation, which was at the expense of new jobs for the unemployed.[18]

Due to wage responses summarized above, it is unlikely that the reduction in standard hours had a beneficial effect on employment in Germany. Indeed, direct estimates of the impact of lowering standard hours on employment are mainly insignificant or very small (see Appendix Table A.1b for a summary). Only Dreger & Kolb (1999) find, on the basis of industry-level data, that the employment of the unskilled is negatively associated with reductions in standard hours. However, this may not be a causal relationship, but merely reflects

[15] The finding of hardly any reaction in overtime hours is confirmed by most other studies, see Hunt (1999) or Schank (2003) for a review. The only noteworthy exception being the study by König & Pohlmeier (1989), who find that overtime hours fully adjust for the reduction in standard hours. Besides the usual caveat with time-series studies, it should be pointed out that their work is based on data before the working time reductions took place.

[16] Appendix Table A.1a summarizes the econometric evidence on the impact of standard hours on hourly wages for Germany.

[17] This is in contrast to the hypothesis of Calmfors and Driffill (1988), who argue in their influential theoretical study that wage demands are more moderate by unions operating at the firm level as well as in an economy-wide bargaining framework, compared with industry-level bargaining.

[18] The rise in unit labor cost can be mitigated by a rise in productivity. Some indirect evidence is offered by Schank (2003). Based on the IAB-Establishment Panel, 1993-1999, he finds that output remains unaffected after within-plant changes in standard hours, which indeed suggests that the hourly productivity has increased considerably after a cut in standard hours.

that both series were moving simultaneously.

It should be noted that the first four studies listed in Appendix A.1b all include the hourly wage as a right-hand side variable. Hence, their estimates measure the direct impact of standard hours on employment, holding wages constant. The papers by Hunt (1999) and Andrews et al. (2005) exclude the wage as an explanatory variable, so that their estimates of the standard hours elasticity control for any negative effect on employment via a rise in wages. Nevertheless, Hunt obtains an overall insignificant impact of normal working time on employment. Only in the case of a ten-industries sample, she obtains for men a positive and significant elasticity (implying that employment falls after a reduction in standard hours), although Hunt notes that "… the point estimates are too large to be plausible" (page 139).

Andrews et al. (2005) provide the only study using plant-level data. Apart from one exception, they do not find evidence of a positive work-sharing effect (and neither a detrimental effect on employment). The presence of unions has no impact, nor does the working-time regime (standard time vs. overtime companies) of the plant.[19] The exception is the large pro-work-sharing effect in small plants (smaller than 100 employees) in the East, non-service sector. However, this represents only a small proportion of the German economy (seven percent of plants and five percent of employment).

To summarize, there is hardly any (econometric) evidence that cuts in standard hours have increased employment. However, unions have increased the utility of their (employed) members, whose income was only slightly reduced when their leisure time went up. This result seems ironic; in Germany reductions in standard working time between the mid-eighties and the mid-nineties were mainly the result of union pressure, who publicly pushed for this policy in order to increase employment.

4. Making Working Time Flexible

Unions achieved their goal of reducing standard hours by conceding various flexible working time arrangements to employers. The introduction of "opening clauses" (*Öffnungsklauseln*), which are usually concluded at the industry level between trade unions and employers, allows companies to deviate under certain conditions and to a certain extent from collectively agreed standards on pay and working time (Bispinck 1997). With respect to the latter, opening clauses include

[19] A potential problem is that the used measure of standard hours is the respective plant's standard work week (excluding overtime). This may deviate from the collectively agreed standard hours and does therefore not measure an exogenous policy change.

(i) the possibility for a certain percentage of employees to work permanently longer than the collectively agreed working time[20]

(ii) the introduction of working time corridors, which allows the companies to extend or to reduce its working time within certain limits. Such corridors have been agreed in the chemical industry (standard hours can be permanently determined between 35 and 40 hours), in the textile and clothing industry (yearly working time can be increased up to 156 hours), and the paper industry (standard working time of 38 hours can be reduced up to 2(3) hours and extended up to 3(2) hours in Western (Eastern) Germany). Based on the IAB-Establishment Panel, in 2004 only 6.4 percent of plants applying any bargaining agreement made use of the provision of working time corridors. However, since the application is positively correlated with plant size, these companies cover about 14 percent of the employees of the whole economy.

(iii) a further working time reduction without wage compensation for a limited period of time. These opening clauses are always linked to the aim of saving jobs and can be found, for example, in the following sectors: metalworking (from 35 (38) hours down to 30 (33) hours in Western (Eastern) Germany), steel (from 35 (37) to 30 (31) hours in Western (Eastern) Germany), printing (reduction of a max. of 5 hours from 35 (38) hours in Western (Eastern) Germany), private banking (from 39 to 31 hours) and insurances (from 38 to 30 hours). According to the IAB-Establishment Panel, in 2004 about 3.2 percent of plants applying any bargaining agreement cut their working time in order to save jobs. These companies employ about 5.3 percent of all workers in the economy.

In addition, the introduction of working-time accounts *(Arbeitszeitkonten)* has become increasingly popular. The basic idea behind working time accounts is the following. Over some specified period of time, an employee is allowed to work longer or shorter hours than (collectively) agreed and thereby collect working time credits or debits in an individual working time account, which are later compensated for by additional free time or work. Many collective agreements contain provisions for the introduction and application of working time accounts (Bispinck 1998), but the implementation is often left to agreements between employers and works councils. Working time accounts differ according to the limits on the maximal credit and debit hours[21] as well as according to the time interval in which these hours must be compensated.

[20] In the metalworking industry, for example, the collective agreement allows 13 respectively 18 percent (depending on the region) of the workforce to deviate from the standard 35-hour week and work between 35 and 40 hours. In addition, in 2004 it was agreed that under certain conditions up to 50% of the employees of a firm could work up to 40 hours. The settlement also imposes that jobs must not be cut as a consequence of increasing the quote above 18% and that hours beyond 35 hours will be paid, but without an overtime premium.

[21] There is a huge variation in the limits (according to bargaining agreements) between industries, but also within industries between the credit and debit hours, although the latter is generally lower. The construction industry, for example, allows for a max. credit of 150 hours and for a max. debit of 70 hours, while the wood and plastics industries set 60 credit and 30 debit hours.

Through working time accounts, companies can better adjust to fluctuations in product demand, and increase their productivity and competitiveness. In addition, firms can decrease costs associated to the existence of a potentially expensive overtime premium. Some argue that the existence of working time accounts increases the demand for labor, or at least stabilizes employment (Koch 2001), though there is no convincing econometric evidence. However, with respect to the employees' preferences, the use of working-time accounts are rather ambiguous. On the one hand, they provide more control over time which may improve job satisfaction and commitment. On the other hand, work pressure may rise due to the company's demand for flexibility (European Industrial Relations Observatory (EIRO), 1998).[22]

In 2004, working time accounts were implemented in 22 percent of all German plants. In these companies, on average 84 percent of the work-force were covered by working time accounts. 42 percent of workers have a working time account.[23] In 2002, the maximum time span until which deviations from the standard work week had to be compensated is less than six months in almost 30 percent of all plants and less than one year in 40 percent of the companies. Another 30 percent respond that there is no maximum time span. Accordingly, arrangements with a (fixed) maximum time interval of more than one year are rare.

5. Increases in Working Time: A new development?

As discussed above, in some industries exist opening clauses from bargaining agreements which allow companies to set standard hours above the collectively agreed working time. Using such opening clauses, recent company-level agreements drew public attention. In 2004, the Siemens electronics group (35 to 40 hours) and the car-maker Daimler-Chrysler (35 to 39 hours for services staff) reached agreements allowing them to increase working time. In exchange, the management of Daimler-Chrysler declared job guarantees to their workers in Germany until 2012, while Siemens cancelled its plan to move 2,000 jobs from North Rhine-Westphalia to Hungary. In both cases, there was no pay increase involved, which effectively implies an hourly wage cut (EIRO, 2004).

In May 2005, the Continental AG, Hannover, increased weekly working time from 37.5 to 40 hours without pay compensation in exchange for a commitment on the side of the company to produce at least 1.3 million tyres in Stöcken. Despite this employment pact, the company announced in November 2005 that it would close down its production site in Hannover-Stöcken and cut 320 jobs. In 2005, the Deutsche Bahn AG increased standard hours

[22] This problem can obviously be reduced by a limit on the maximum working time credit.
[23] Own calculations with the IAB Establishment Panel. The share of workers is larger than the share of plants since the incidence of workting time accounts rises with plant size.

from 38 to 39 with pay increase. While Deutsche Telekom AG reduced its standard working time from 38 to 34 hours, it is believed that a number of other larger companies currently consider to increase their working time (EIRO, 2004). Increasing working time without wage compensation is probably (for employees) a less painful measure when a firm attempts to control labor costs than cutting jobs or reducing bonuses.

From the 12,400 non-public plants which answered the question in the IAB-Establishment Panel 2004, 328 (174) responded that they had increased (decreased) standard hours over the last twelve months (see Table 3). Monthly wages remained constant – i.e. hourly wages fell approximately by the same percentage as the increase in standard hours – in two thirds of the plants which increased standard hours. Only one out of five plants had fully compensated its employees – i.e. hourly wages did not change – for the extended working time. Similarly, hourly wages remained constant in nearly 60 percent of the plants which decreased standard hours. Only one quarter of plants with reduced standard hours provided full wage compensation for the workforce (i.e. monthly income remained constant).

While extensions of standard working time are a contentious topic in the public debate in Germany, the numbers indicate that at the company level we still observe reductions in standard hours. In fact, weighted numbers from the IAB-Establishment Panel show that between 2002 and 2004 10.2 (11.0) percent of Western German plants decreased their standard hours, whereas 16.5 (8.0) of the plants extended their working time.[24]

Table 3 also reports employment growth between 2003 and 2004 for each plant-type. For plants extending their working time, the growth rates do not differ between full and no wage adjustment. Since wage costs are effectively reduced for the latter group, we could have expected a positive impact on employment. However, sample selection and the small size of the sample make the conclusion difficult to draw. We will have a closer look at the relationship between extension of standard hours and employment growth in the next section.

6. Job Stability through Increases in Standard Hours?

In this section, we report regression estimates of a change in standard hours between 2004 and 2002 on the growth in employment and on the growth in productivity (value added per hour) over the same period. This is one of the first attempts to evaluate the effects of agreements on increasing standard hours like those at Daimler and Siemens reported above.

In contrast to the last section (see also Table 3), changes in standard hours are not identified by direct responses

[24] These figures are higher than those implied by the absolute numbers listed in the previous paragraph since they refer to a two-year period and they are weighted.

of the plant owners, but by comparing standard hours in 2004 with those reported for 2002. Hence, the sample of changers gets larger (since there are two years between), but there is no direct information on whether this was accompanied by full or no wage compensation.

We focus on the non-public sector only. To avoid the results being influenced by outliers, we have dropped plants with an employment growth of more than 100 percent and (in the regressions explaining value added) plants with a growth in value added per employee of more than 100 percent. In addition, plants which changed their working time by more than 10 hours and companies which reported a standard work week below 28 or above 48 hours were not included.

Before discussing the regression results of the employment and productivity growth equations, it will be interesting to have a look at the characteristics of those plants which have changed their standard hours between 2004 and 2002 (see Appendix Tables A.2a and A.2b for the full results of a multinomial logit estimation on decreasing versus constant versus increasing standard hours). This complements the findings of Table 2 (Section 2), where we have investigated the relationship between the actual change in standard hours and the transition between bargaining regimes.

We should note that several variables differ in their impact between Western and Eastern Germany. Plants with a larger past employment growth have a higher probability of decreasing (increasing) standard hours in Western (Eastern) Germany. As expected, it is less likely that standard hours have been decreased between 2002 and 2004, if the plant worked overtime in 2002. Surprisingly, in Western Germany the performance of overtime reduces the probability of an increase in normal hours by five percent. In Eastern Germany only, the existence of a works council makes it more likely that standard hours are reduced. As has been expected, investment in ICT-technology is negatively related with a subsequent reduction in hours, while it has absolutely no impact on the probability of increasing normal working time. In Western Germany, small plants have a higher probability to change standard hours in either direction, which is not the case in Eastern Germany.

Employment regressions are run for all workers and also for separate subgroups. For the latter, the dependent variable is computed by the change in employment (in the respective subgroup) divided by total employment in 2002.[25] We allow for separate effects of reducing and extending standard hours. Besides standard working time, the following right-hand-side variables are included: employment growth between 2002 and 2000, value added per employee in 2002, a dummy indicating whether or not overtime existed in 2002[26], the export share within

[25] Genuine growth rates for the subgroups would provide lots of missing values due to a zero in the denominator.
[26] Unfortunately, a dummy variable is the only information on overtime work. Hence, we could not fully control for a potential substitution of standard hours for overtime hours.

total sales, the profit situation in 2002, existence of a works council in 2002, a dummy for investment in ICT in 2002, dummies for plant age, bargaining dummies, firm size and sectoral dummies.[27]

Table 4 reports the parameter estimates on the change in standard hours. The main results are as follows:

1. There is a negative relationship between total employment growth and increasing standard hours. C.P., a rise in working time by 1 hour is associated with a shrinkage in employment by 1 (1.7) percent in Western (Eastern) Germany.
2. By contrast, decreasing standard hours does not affect employment growth.
3. For Western Germany, an increase in standard hours by 1 hour reduces productivity per hours worked by 3.4 percent. Surprisingly, reducing standard hours by 1 hour is also related with a decrease in productivity per hour by 3.1 percent. We suspect that this is due to firms in a downturn not fully adjusting labor input to the fall in output.
4. The respective coefficients of the productivity regressions for Eastern Germany are also negative, but of a smaller magnitude and insignificant. However, in this case we expect substantial measurement error in the dependent variable which – as is well-known – becomes more important when using changes over time (as in our context).[28]
5. The effects on different skill categories are not uniform, but are in most cases insignificant. For Western Germany, the negative relationship between extending normal working time and employment growth discussed above is found for the skilled blue-collar workers.
6. For Western Germany (only), there is a negative relationship between extending standard hours and part-time employment. This is what standard economic theory predicts (since labor costs of a full-time worker fall). However, the share of part-time workers is also negatively associated with decreasing standard hours (both, for Western and Eastern Germany). As reported above, total employment remains unaffected after a cut in standard hours, which suggests a substitution from part-time to full-time employment.[29]
7. The parameter estimates on other fringe-workers (temporary and subcontracted employees) are in most cases insignificant. Nevertheless, they are negatively related with increasing and also (in all but one case) with decreasing standard hours.

[27] These variables are equivalent to those included in the multinomial logit regression.
[28] Firstly, the reported percentage share of total sales represented by material costs (which is used to compute our measure of value added) is believed to be an "informed guesstimate". This is reassured by the fact that two third of the observations (on material costs) are multiples of 5 percent. Secondly, the hours variable consists only of normal working time, while productivity per actual hours worked (including overtime) would be the more appropriate measure. In particular, plants which have increased standard hours may have cut overtime work, in which case the estimated (negative) effect on productivity is biased downwards.
[29] This may arise because some employees switch from part-time to full-time status, but obviously one cannot identify with plant-level data whether the observed effect is due to within or between-worker substitution.

8. The rate of female workers is totally unaffected by a change in hours.

These findings should be taken with some caveat. We have conditioned the impact of changing standard hours on employment (and productivity) growth on a battery of variables from 2002 and the employment growth between 2002 and 2000, in order to control for differences between plants which increase (decrease) standard hours and those which do not. Nevertheless, there may still be unobserved factors which influence the propensity to increase/decrease standard hours and simultaneously employment growth. We leave it for future research to control for this endogeneity problem.

One should also keep in mind that the results are based on a relative small number of plants changing their standard hours (see first column in Table 4). Furthermore, we have only looked at the contemporaneous relationship between standard hours and employment while future waves of the IAB panel will allow us to investigate whether changes in standard hours between 2002 and 2004 have different long-run employment effects than those reported above. Finally, the impact of a rise in standard hours on employment depends on whether or not the monthly wage remains constant or whether it is adjusted accordingly (see also the theory chapter). Linking the IAB-Establishment Panel to the employment statistics register (*Beschäftigtenstatistik*) will provide (precise) information on the development of employees' wages at the individual level. This will allow us to condition the relationship between standard hours and employment on whether or not wages have been adjusted accordingly.

Subject to the caveats discussed above, the preliminary results of the empirical exercise undertaken in this section are rather pessimistic. They do not offer evidence in favor of the claim that job stability rises through increases in standard hours (and thereby lowering costs), but rather suggest the opposite.

7. Conclusions

This chapter has focused on working time developments in Germany, where standard hours have been reduced between the mid-eighties and the mid-nineties in order to increase employment. However, econometric studies have found no evidence that work-sharing boosts employment in Germany. Rather, unions have achieved their goal of (near) full wage compensation. In other words, unions sacrificed their postulated goal – namely new jobs for the unemployed – to secure a higher utility for those employed (whose income does not change when their leisure increases).

While aggregated standard hours remained stable during the last ten years in Western Germany or fell only

slightly in the East, we observe considerable between and within-plant variation in working time. This is due to the introduction of opening clauses, which allow companies to deviate under certain conditions from collectively agreed standard hours. Also, 30 (45) of the employees in Western (Eastern) Germany work under individual regulation and standard hours are highest in these plants. We have found evidence that plants leave industry-wide agreements to increase standard working time (the coefficient estimate implies a difference-in-difference of 33 minutes for Western Germany, as compared to those which keep their industry-wide agreements).

The company-level agreements of Siemens and Daimler Chrysler in 2004 are two noteworthy examples of rising standard hours to cut unit labor costs. The number of plants which followed is still small and whether increases in standard hours should be a general strategy to stabilize (or even increase) employment is a contentious topic at the moment in Germany. Our preliminary regression results show a negative relationship between an increase in standard hours and employment. Ceteris paribus, a rise in working time by 1 hour is associated with decreasing employment by 1.0 (1.7) percent in Western (Eastern) Germany. Essentially, part-time workers are replaced by (less) full-time employees. More general (causal) conclusions are hard to draw, in particular when one recalls that decreasing or increasing standard hours is mostly found in small or very small firms in Western Germany.

Box 1: The IAB-Establishment Panel

The German data we use are from the IAB-Establishment Panel Data Set collected by the Institut für Arbeitsmarkt- und Berufsforschung (IAB), Nuremberg, Germany.[30] This yearly survey has been conducted since 1993 in Western Germany, and since 1996 in Eastern Germany. Information is obtained by personal questioning carried out by Infratest Sozialforschung, Munich, with voluntary participation by plants managers. Altogether, the (unbalanced) IAB panel comprises between 1993 and 2004 126,381 observations and 35,509 plants. Detailed descriptions of the IAB-Establishment panel can be found in Kölling (2000).

The sample is drawn from the employment statistics register of the German Federal Office of Labour, which covers all plants with at least one employee (or trainee) subject to social security.[31] All plants included in the population (i.e. all plants included in the employment statistics register) are stratified into 400 cells, which are defined over 10 plant sizes, 20 industries and two regions (Western vs. Eastern Germany), from each of which the observations of the establishment panel are drawn randomly. Large plants are over-represented in the IAB panel. In the first wave (1993), for example, the probability of being drawn was on average 91 percent for plants employing more than 5,000 employees, but only 3 percent for plants employing between 100 and 200 employees and as small as 0.1 percent for plants with less than 5 employees. The over sampling of large plants implies that the survey covers about 0.8 percent of all plants in Germany, but 8 percent of all employees.[32]

Interviewers ask about 80 questions each year on topics including: detailed information on the decomposition of the work-force (gender, skill, blue-collar vs. white-collar, part-time employees, apprentices, civil servants, owners) and its development through time; business activities (total sales, input materials, investment, exports, profit situation, expectations, whether plant does R&D, product and process innovations, organizational changes, technology of machinery, adopted plant policies/strategies); training and further education; wages; lots of information on working time (standard working time, overtime, percentage of employees working overtime, percentages of employees working on Saturdays, working on Sundays, working on shifts, and working with a flexible working time schedule); and general information about the plant (whether plant is subunit of a firm, ownership, birth year, existence of works

30. The IAB (in English Institute for employment Research) is the research institute of the Federal Employment Services in Germany.
31. For 1995, the employment statistics cover about 79 percent of all employed persons in Western Germany and about 86 percent in Eastern Germany, (Bender, Haas and Klose, 2000).
32. Population weights, which are the inverse of the sample selection probabilities, are available for empirical analysis.

council, whether plant applies bargaining agreement, whether plant has been merged with or split from another plant in the last year, three-digit industry affiliation, region). While most questions are asked yearly (or on a two-year/ three-year basis), some topics have been surveyed only once.[33]

Information on weekly standard working time is available for all years except 1994, 2000 and 2003. A reliable (time-series) measure of actual hours worked cannot be constructed since quantitative information on the overtime volume is only available in some years. Furthermore, the question asked changes through time and there has been considerable non-response on this item. There is no usable information on different bargaining regimes before 1995. Therefore, this study uses observations of the years 1995-2004, excluding 2000 and 2003.

Table 1: Distribution of standard working time at the company level, 2004

	Western Germany	*Eastern Germany*
Average weekly working hours:	38.39	39.62
% of employees working:		
below 35 hours	1.5	0.9
35 hours	10.4	1.3
36-37 hours	4.9	3.4
37.5-38.5	44.5	13.2
39-39.5	9.0	7.8
40 hours	24.7	69.0
above 40 hours	4.7	4.4

Source: IAB-Establishment Panel. Employment-weighted.

Table 2: Standard Hours and Bargaining Agreements: Dependent Variable: Changes in Standard Hours

33. For example, the question on whether or not changes in standard hours were accompanied by adjustments in the monthly wage was only asked in 2004.

OLS Regression Estimates[a-c]

	Unweighted		*Weighted*[d]		*No of obs:*
	Western	Eastern	Western	Eastern	*Western/*
Bargaining agreements in *t-1* and *t*					*Eastern*
$None_{t-1}$ * $None_t$	Reference		Reference		5,406/ 7,451
$None_{t-1}$ * Industry $Level_t$	-0.028	-0.004	-0.043	-0.082	722/
	[-0.49]	[-0.06]	[0.38]	[-0.98]	460
$None_{t-1}$ * Firm $Level_t$	0.010	-0.022	0.044	0.031	135/
	[0.08]	[-0.23]	[0.34]	[0.31]	229
Industry $Level_{t-1}$ * $None_t$	0.311	0.213	0.499	0.232	900/
	[5.91]	[3.77]	[4.52]	[3.28]	722
Industry $Level_{t-1}$ * Industry $Level_t$	-0.039	-0.005	-0.045	-0.004	11,704/
	[-1.48]	[-0.16]	[-1.41]	[-0.10]	4,028
Industry $Level_{t-1}$ * Firm $Level_t$	0.070	-0.042	0.040	-0.021	237/
	[0.71]	[-0.40]	[0.51]	[-0.28]	198
Firm $Level_{t-1}$ * $None_t$	0.203	0.016	0.109	0.175	283/
	[2.27]	[0.25]	[0.98]	[1.29]	581
Firm $Level_{t-1}$ * Industry $Level_t$	-0.029	0.009	-0.046	0.013	312/
	[-0.34]	[0.10]	[-0.56]	[0.21]	247
Firm $Level_{t-1}$ * Firm $Level_t$	-0.007	0.018	-0.041	0.087	777/
	[-0.11]	[0.30]	[-0.46]	[1.79]	720
Works Council (Dummy: 1 = yes)	-0.032	-0.040	-0.038	-0.071	
	[-1.35]	[-1.25]	[-1.80]	[-2.26]	
R^2	0.007	0.004	0.011	0.006	
No of. Observations					
Total	20,476	14,636	20,342	14,445	
Changes in working time	5,637	2,542			

[a] t-values in brackets. 1996(1997)-2004, but excluding 2000 and 2003, for Western (Eastern) Germany, IAB-Establishment Panel. Changes in standard hours in 2004 and 2001 refer to a two-year difference. For consistency, in these years the bargaining dummies refer to *t* and *t-2*.

[b] Not included are: (i) the public sector (ii) observations with a change in the bargaining regime between t and t+1 (iii) observations where the change in working time exceeded ten hours (iv) observations where the reported standard

hours were below 28 or above 60.

[c] Regressions also include year dummies. Dummies for firm size respectively industry were jointly insignificant.

[d] Weights are constructed by multiplying the appropriate survey sample weight by employment.

Table 3: Adjustment in monthly wages after changes in standard hours

Number of observations and employment growth

Change in standard hours	No information	Monthly Wage Adjustment			Total
		Fully	Partly	None	
None	n.a.	n.a.	n.a.	n.a.	11,898 (-0.011)
Extension	8	83 (-0.024)	52 (0.010)	187 (-0.026)	328 (-0.018)
Reduction	3	94 (-0.019)	28 (-0.001)	49 (-0.015)	174 (-0.015)

[a] IAB Establishment-Panel, 2004.

Table 4: OLS-estimations of growth in employment and value added per hour.

Parameter estimates on the change in standard hours between 2004 and 2002. Private companies [a-c]

Dependent variable:	**Rate of employment change between 2004 and 2002** [d]									**Growth in value added per (standard) hour between 2002 and 2004**
	Total [e]	-0.034	Un-skilled White-Collar	Skilled Blue Collar	Skilled White Collar	Part-time Workers [f]	Females [f]	Tempo-rary Workers [f]	Subcon-tracted Workers [g]	
Western Germany										-0.034
Increase in standard hours (obs= 394/ 278)	-0.010 [1.95]	-0.003 [0.64]	0.001 [0.23]	-0.012 [2.12]	0.005 [0.82]	-0.010 [2.04]	-0.002 [0.46]	-0.001 [0.67]	-0.005 [1.02]	-0.034 [3.85]
Decrease in standard hours (obs = 295/ 203)	-0.002 [0.23]	-0.011 [1.34]	0.005 [1.42]	0.005 [1.01]	0.001 [0.25]	0.008 [1.18]	-0.000 [0.04]	0.005 [1.34]	0.006 [1.32]	-0.031 [2.69]
Eastern Germany										
Increase in standard hours (obs = 153/ 107)	-0.017 [1.88]	0.002 [0.27]	-0.002 [0.30]	-0.009 [0.82]	-0.009 [1.05]	-0.006 [0.59]	-0.006 [0.58]	-0.003 [0.47]	-0.000 [0.02]	-0.017 [1.21]
Decrease in standard hours (obs = 162/ 113)	0.003 [0.44]	-0.001 [0.15]	0.002 [1.07]	0.005 [0.57]	-0.004 [0.43]	0.012 [1.86]	0.001 [0.24]	-0.004 [1.10]	0.008 [1.83]	-0.006 [0.42]

[a] Source: IAB-Establishment Panel. Excluded are plants which reported a standard work week of more than 48 or less than 28 hours, plants which reported a change of more than 10 hours between 2004 and 2002 as well as plants with a growth in employment (value added per employee) of more than 100%.

[b] 2,221 (1,977) observations for Western (Eastern) Germany in the employment regressions. 1,619 (1,508) observations for Western (Eastern) Germany in the value added regressions. Lower sample size in the value added regressions due to missing values. Absolute t-values in brackets. Further independent variables equivalent to those reported in the Appendix Tables A.2a and A.2b.

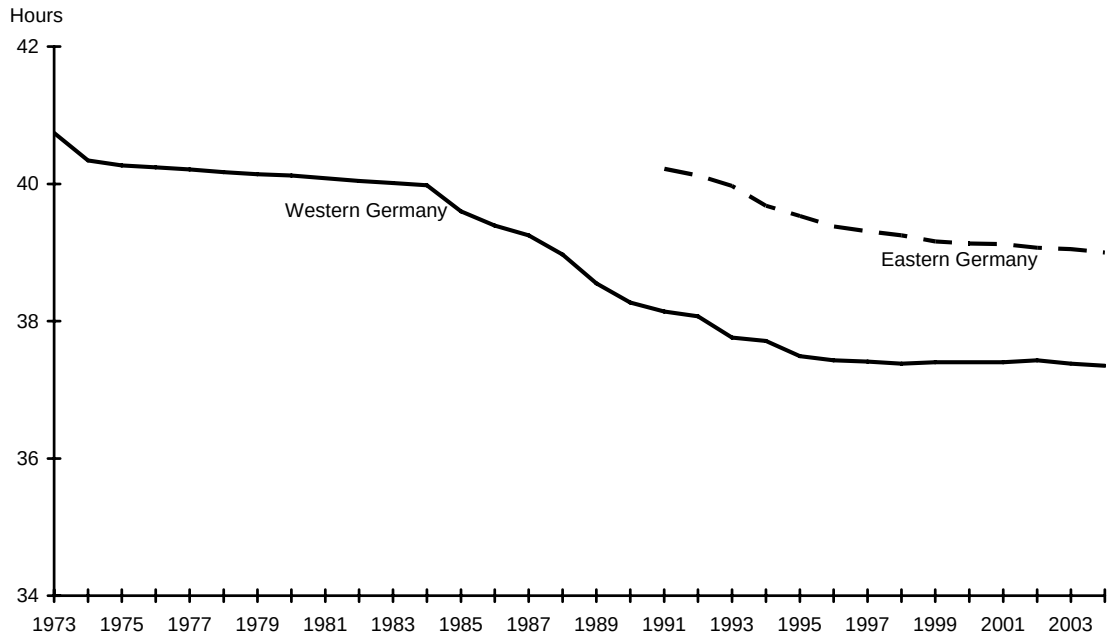
[d] Measures are computed as the change in employment in the respective subgroup divided by the plant's total employment in 2002.

[e] *Total* decomposes of the subgroups in the following four columns plus (unreported) managers/plant-owners.

[f] Part-timers, females and temporary workers are contained in *Total* and are not mutually exclusive. Any part-timer, for example, is either skilled or unskilled and either a permanent or a temporary employee.

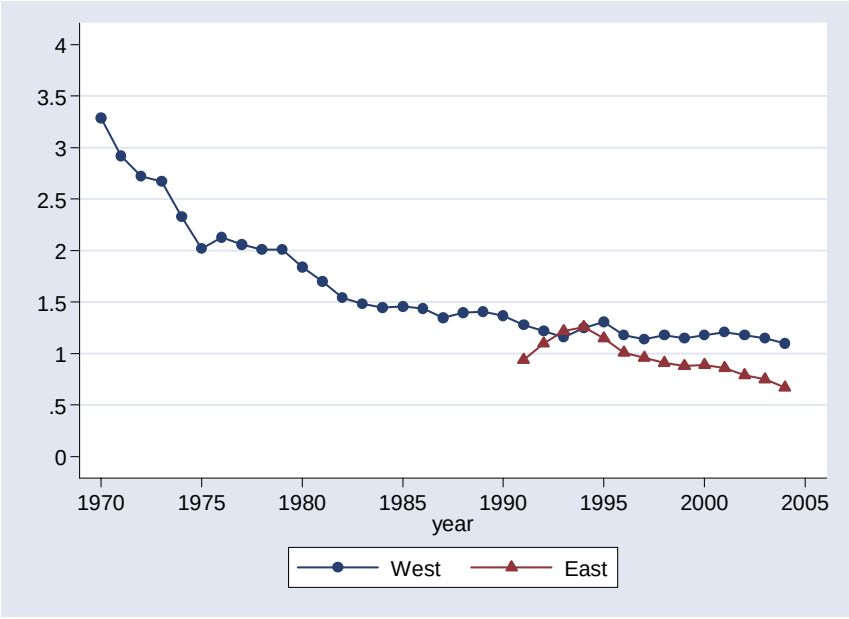
[g] Subcontracted workers is in addition to total employment and are not contained in any of the other groups.

Figure 1: Standard Working Time determined by Collective Bargaining



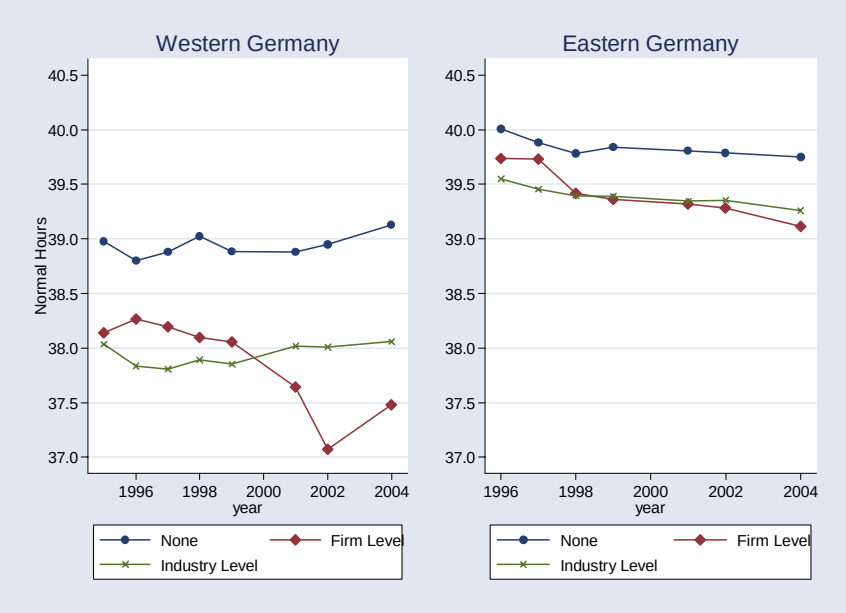
Source: Tarifregister of the BMWA

Figure 2: Development of Weekly Paid Overtime Hours



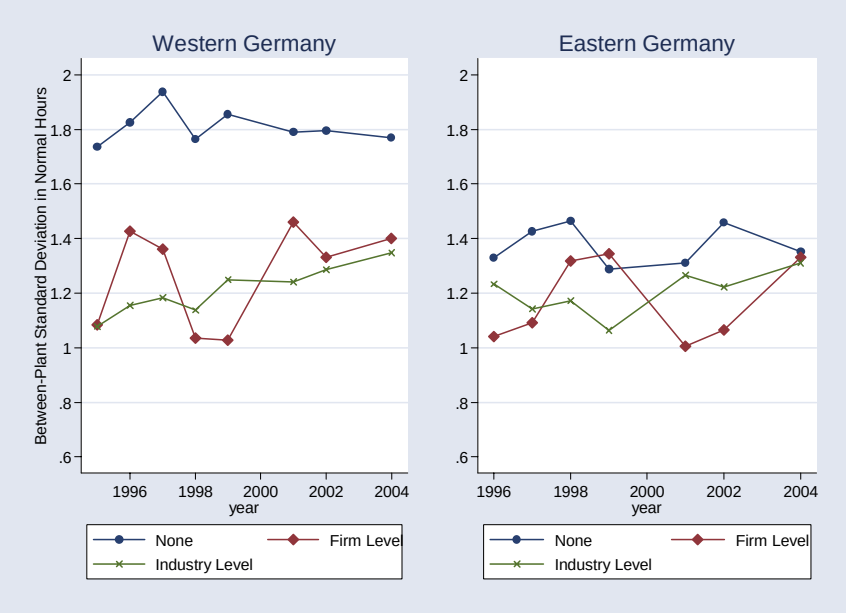
Source: IAB-Arbeitszeitrechnung

Figure 3: Standard Working Time at the Company Level, by Bargaining Agreement[a]



[a] Source: IAB-Establishment Panel.
Weighted Statistics (weights are constructed by multiplying the survey weights by employment).

Figure 4: Between-Plant Dispersion in Standard Working Time, by Bargaining Agreement[a]**; Normalized**[b]



[a] Source: IAB-Establishment Panel.
Weighted statistics (weights are constructed by multiplying the survey weights by employment).
[b] Industry and plant size effects have been removed.