Safeguarding Jobs through Labour Hoarding in Germany

By Martin Dietz*, Michael Stops**, and Ulrich Walwei***[1]

Abstract

As a consequence of the global financial crisis Germany has experienced the deepest slowdown of its economy since World War II. However, at least up to now the German labour market has not shown a strong reaction to the financial crises. Given the sharp decrease in GDP the levels of employment and unemployment are still quite stable. One possible reason for the recent development is an increased level of labour hoarding, indicating that firms do not immediately adjust labour input in line with demand for their products. The paper uses both aggregate and firm-level data in order to examine the extent to which labour hoarding has contributed towards stabilising the labour market during periods of recession. In addition, we examine the extent to which subsidised types of labour hoarding, such as short-time work, may have facilitated the retention of workers by employers. The paper shows that labour hoarding has been of certain relevance for the German labour market in times of economic slack. This is obviously true during the current crisis. Nevertheless, short-time work has also been used by firms which were not suffering significantly from an underutilisation of their capacities. To avoid windfall gains the state should consider more effective targeting systems or advocate functional equivalents such as more flexibility in working time.

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* IAB – Institute for Employment Research.
** IAB – Institute for Employment Research.
*** *Corresponding author.* IAB – Institute for Employment Research. E-mail address: ulrich.walwei@iab.de.
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1. Introduction

As a consequence of the global financial crisis Germany has experienced the deepest slowdown of its economy since World War II. In particular export-oriented firms in manufacturing are facing shrinking demand and therefore an underutilisation of capital and labour. However, the German labour market is still quite robust. Up to now, the reduction of employment and the increase in unemployment remain rather low. This is remarkable for two reasons. On the one hand, the labour market response in previous recessions was quicker and stronger. On the other hand, the labour market response has been weaker than in other countries. Macroeconomic figures are first indicators pointing to the possible relevance of labour hoarding at firm level. Besides the effort of firms to preserve jobs, the German government has made an important contribution which has helped to safeguard employment by making short-time work more attractive during the crisis.

In our paper we shed light on different options for companies to adapt their employment level to economic shocks. In particular we focus on the phenomenon of labour hoarding, which means here that firms do not immediately alter labour input in line with a decline in their production. The paper starts by discussing companys' reasons for this behaviour, considering both the costs of labour hoarding as well as its opportunity costs. Also state intervention in the form of subsidies for short-time work can play an important role.

In the third section we look for evidence of labour hoarding at the macro level of the German labour market. This part of the paper is based on aggregate data and looks at developments of labour productivity, which is used as a proxy for the utilisation of labour. The data cover several business cycles as well as developments within different industries.

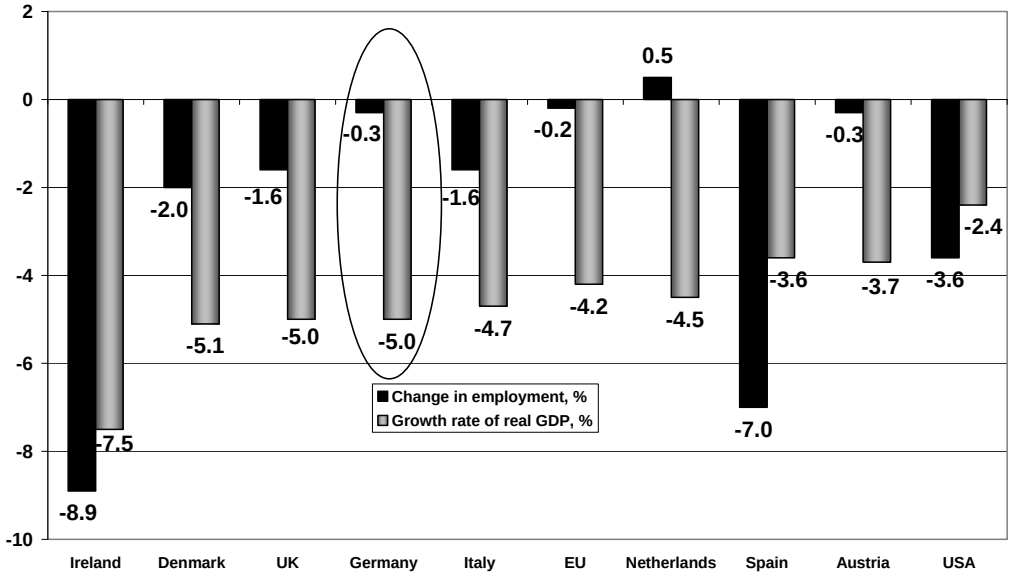
At the firm level there is, unfortunately, a lack of data concerning the current situation. For this reason we take data from the IAB Establishment Panel for the years 2002 to 2004 in order to examine firms' strategies of labour hoarding during that period of economic downswing. What are the characteristics of firms engaged in labour hoarding and to what extent did they use short-time work? By analysing these data we try to gain some information concerning the portfolio of firms' strategies for dealing with a negative shock, concerning windfall gains and the possible substitution of non-subsidised labour hoarding by subsidised short-time work. The results can be used to shape more effective short-time work schemes or functional equivalents in the future.

2. Labour hoarding as a response to economic shocks

When looking at the transmission of shocks on goods markets to the labour market we typically observe some kind of a time lag. Obvious reasons are institutional features of the labour market providing workers with job security in times of uncertainty, e.g. employment protection legislation. Thus, to a certain degree labour hoarding is unavoidable on an institutionalised labour market such as we see in Germany. The length of the delayed labour market response to shocks on the goods markets depends, for example, on the rigidity of employment protection for standard work arrangements and the way more flexible (temporary) work arrangements are legislated. Indeed, we observe different labour market reactions in an international comparison. While countries with a weak employment protection system like the US and Ireland or with a large proportion of fixed-term contracts like Spain show quick and strong reactions with respect to employment, in Germany the labour market response has remained fairly small with respect to the strongest decrease in GDP since World War II (Chart 1). This partly reflects the fact that German companies still face relatively strict employment protection legislation for their core staff. Germany comes third in a ranking of the OECD countries according to the strictness of their protection of permanent workers against (individual) dismissals (Venn 2009).

Chart 1

Changes in Real GDP and in Employment in Selected Countries
- 2009 compared to 2008 -



Source: Eurostat.

When taking a closer look at the labour market impacts of the current crisis in Germany it is important to consider the options that companies face with respect to employment decisions. In general we can differentiate between external and internal measures for generating flexibility of labour input. With regard to external flexibility, lay-offs are an obvious response to decreases in demand. This reaction is restricted by employment protection legislation. Due to the strict legislation concerning standard work arrangements, atypical forms of employment such as marginal part-time work and agency work have gained in importance in Germany during recent years. Especially the hiring of agency workers serves as an instrument to react quickly to short-term fluctuations in labour demand.[2] Indeed we observe that agency work has suffered heavily from the crisis. The numbers decreased sharply by almost 40 per cent from a maximum of 820,000 in July 2008 to around 580,000 in April 2009 (Statistik der Bundesagentur für Arbeit 2010). So agency work may also be interpreted as a buffer protecting the core of a company's workforce from short-run fluctuations.

However, institutional rigidities and partial adjustments through temporary work cannot fully explain the robustness of the German labour market during the current recession. Firms have also increased internal flexibility in order to keep their employees. So the question is: What are the possible reasons for firms preserving jobs despite facing a clear drop in labour demand? We need to take a closer look at the issue of labour hoarding, its definition, the rationale behind it and possible intervention by the state.

A straightforward definition of labour hoarding is that current employment is higher than required employment (Blankart 1973). The problem with this definition, however, is that the amount of required employment is hard to evaluate from an outsider's perspective. So the firm's adjustment of labour input might be a better way to approach the phenomenon of labour hoarding: we observe labour hoarding when firms do not immediately adjust labour input in line with demand for their products and in particular allow their utilisation of labour to vary over the business cycle (Taylor 1982). This may result in a reduction of hours worked and a reduction of work intensity, or to lower productivity per head and per working hour (Bosworth/Westaway 1990). In line with this, Hamermesh (1993) defines labour hoarding as a less than proportionate decrease in total hours worked in response to a negative demand shock.

[2] There is also increasing use of fixed-term contracts, which often serve as a prolonged probationary period, especially for younger people. However, the use of fixed-term workers is not as flexible as hiring agency workers. Hohendanner (2010) shows for Germany that the number of fixed-term contracts decreased only moderately from 2008 to 2009 as they are often used in businesses not affected strongly by the crisis.

What is the rationale behind labour hoarding? From a perspective of profit maximisation in a world with homogeneous labour and without transaction costs such behaviour can hardly be explained. Under these circumstances, an underutilisation of labour means that companies stand to the right of their labour demand curve, so they fail to minimise costs at a given production volume. Competition would cause these companies to disappear from the markets.

However, real-life markets are much more complex and companies' decisions on hiring and firing are made on a broader basis than just weighing up actual wage rates and marginal productivity (de Koning 1989). This is rational because a pure strategy of external flexibility implies various transaction costs (Oi 1962, Brechling 1965, Bowers/Deaton/Turk 1982, Horning 1994). In addition, side effects on the work attitudes of the staff have to be considered and can be regarded as indirect costs of labour hoarding (Okun 1981). All in all, the company has to examine the entire opportunity costs to reach a decision on labour hoarding.

Let us briefly summarise some important factors that impose costs on lay-offs, thus making labour hoarding relatively attractive. We have already mentioned costs caused by formal regulations concerning employment protection or redundancy payments. But there are also several costs that are not related to state intervention. Transaction costs play an important role on imperfect markets. Firms will face search costs when demand for their goods rises again and they need to hire new employees. In addition, costs will be incurred for setting up the labour contract and conducting job training (Bentolila/Bertola 1990).

Of course the impact of transaction costs will vary according to several factors. First, the overall labour market situation will be important. When there has been a period of difficulties with respect to the supply of labour in specific sectors in the past, firms will expect long periods of vacancies and thus high recruitment costs. Under such circumstances labour hoarding becomes plausible up to a certain degree. In particular with regard to skilled workers there are incentives for labour hoarding because these are the workers that will be needed urgently during the (next) upswing (James/Thomas 1998).

Besides these market-related aspects, there are also benefits of labour hoarding resulting from the employment relationship itself. If tasks are highly firm-specific the termination of an

employment contract is accompanied by a loss of important firm-specific knowledge which will be time consuming and costly to regain (Oi 1962, Becker 1975, Williamson et al. 1975). Again, this will be more relevant for high-skilled workers with complex tasks than for low-skilled people engaged in routine jobs (Kruppe/Mosley 1996).

Moreover, labour contracts are incomplete by nature and informal rules or social norms play an important role for the effectiveness of labour relations. This becomes more and more important in knowledge societies where tasks are complex and input-output relations are difficult to monitor. Here, principal-agent problems are difficult to handle by means of financial incentives or sanctions, and trust and reciprocity are important ways of enhancing work effort (Akerlof 1982, Fehr/Gächter 2000). These informal mechanisms need a long-term relationship to evolve and become stable (Buttler/Walwei 1993, Marsden 1995). If the employment contract becomes relational (Macneil 1974) which means that the labour relation has a value as such, the costs of lay-offs will increase further, resulting in an irreversible loss of firm-specific and relational capital. This not only affects the specific employment contract – the loss of trust may spill over and destroy reciprocal behaviour on a broader basis among the remaining staff. In addition, the company's reputation as a reliable employer is weakened, which might induce quitting and hamper future recruitment (Okun 1981). In contrast, labour hoarding is an approach that is complementary to norms of reciprocity and trust, because it signals that firms are willing to invest in safeguarding a stable employment relationship. In doing so, a high level of work motivation can be sustained.

There are thus several reasons for labour hoarding that can be derived from an institutional perspective as well as from market reasons and the logic of modern employment relationships. These benefits of labour hoarding have to be weighed against its costs, which are associated with lower labour productivity and a corresponding increase in unit labour costs. So the price for labour hoarding is a decreasing competitive position of the firm on the goods market in the short run. An important factor for this consideration is how long the firm expects the decline in demand to last. Labour hoarding will be more favourable when companies are facing only short-term declines in production, while expectations of a deep and long-lasting decline increases the likelihood of lay-offs and makes transaction cost arguments less important: labour hoarding tends to become inefficient. Output uncertainty is crucial in this respect and can not really be avoided (de Koning 1989). If firms adjust their labour input to the levels of sales volume that may be achieved under favourable conditions, they run the

risk of being left with unneeded workers. If they decide to reduce staff, they may be short of workers afterwards.

Finally, labour hoarding can also be encouraged by state intervention. One well-known option is to subsidise working time reductions via short-time work. Typically the unemployment insurance scheme partly compensates for workers' income losses and the costs of labour hoarding for firms. The benefits of short-time work schemes for firms are obviously similar to non-subsidised labour hoarding. The additional advantage is that labour costs are reduced immediately. The magnitude of savings on the part of the firm depends on specific features of the short-time work scheme. Important issues in this respect are the level and the duration of benefits to compensate for some of the wage losses and possible direct subsidies, e.g. concerning social security contributions. Germany is one of the countries with a long tradition of short-time work. At the moment there are three types:

- Cyclical short-term work ("Konjunkturelle Kurzarbeit") in case of a temporary, unavoidable loss of employment due to economic factors or to an unavoidable event.
- Transitional short-term work ("Transfer-Kurzarbeit") in case of a permanent loss of employment due to re-structuring measures on the establishment level.
- Seasonal short-term work ("Saison-Kurzarbeit") in case of non-productive times due to weather conditions.

In particular during the course of the current crisis, conditions for cyclical short-time work have been made more attractive to firms by extending the maximum duration, giving financial support for training schemes and reducing social security contributions. Table 1 offers information about requirements concerning cyclical short-time work, which is by far the most important type of short-time work.

Table 1

Requirements for the use of cyclical short-time work and recent changes

Requirements for use	Pre-crisis regulations (since 1997)	Recent Changes
Significant unavaidoble loss of work	Temporary loss of work due to economic reasons	No or minor changes
	Other options of internal flexibility need to be utilized	January 2009: Under certain conditions working time accounts need not necessarily be reduced.
	At least one third of the staff must be affected	February 2009 until October 2010: Compensation can be granted even if the firm is not able to provide full employment to at least one jobholder.
	Estimated loss of income for the entire staff of at least 10 p.c.	No or minor changes
Requirements to the establishment	At least one regularly employed jobholder	No or minor changes
	Good chance that firm returns to regular working hours	No or minor changes
Individual requirements	Employment contract need to be maintained	No or minor changes
	Short-time worker is obliged to accept job offers from Federal Employment Agency	No or minor changes
	Excluded are recipients of unemployment benefits or subsistence allowances while participating in publicly financed training measures.	No or minor changes
Notification	Employers or works councils are obliged to notify the estimated loss of work of the local employment agency.	No or minor changes
Social security contributions	Contributions are reduced to 80 p.c. for the loss of working hours.	No or minor changes
	Employers have to cover the full amount.	February 2009: Federal Employment Agency covers 50 p.c. of the contributions for the loss of work. In case of training during the loss of work, the agency covers 100 p.c. of the contributions. Costs of training measures can be reimbursed.
		July 2009: Agency covers 100 p.c. of the contributions for the loss of work from the seventh month of short-time work.
Duration of benefits	Maximum duration of six months.	January 2007 until June 2007: 15 months July 2007 until December 2008: 18 months January 2009 until December 2009: 24 months January 2010 until December 2010: 18 months
Level of benefits	60 p.c. of the net wage loss due to shorter hours	No or minor changes
	67 p.c. with at least one dependent child	No or minor changes

Source: Social Code III, as amended from time to time

However, the costs of subsidised working time reductions are not only borne by the state with respect to wage-related tax losses and the unemployment insurance system with respect to benefit payments. Employees accept a reduction of their net income. Firms have to deal with a lower capital utilisation and they have to bear the remaining costs such as social security contributions for the reduced working hours or holiday pay. For the case of Germany, Bach et al. (2009) estimate that the remaining costs for firms amount to up to 35 per cent of the usual labour costs.

Given output uncertainty, the option of short-time work creates an incentive for firms to run the risk of labour hoarding. Nevertheless, a firm can only benefit from the costly retention of workers if the reduction in working hours is actually temporary and if the affected workers do not leave the firm voluntarily. We also need to assume that laid-off workers may not return to their employer even in the absence of a short-time work scheme. Such "recalls" are used for significant shares of workers in countries where temporary lay-offs are feasible (Kruppe/Mosley 1996).

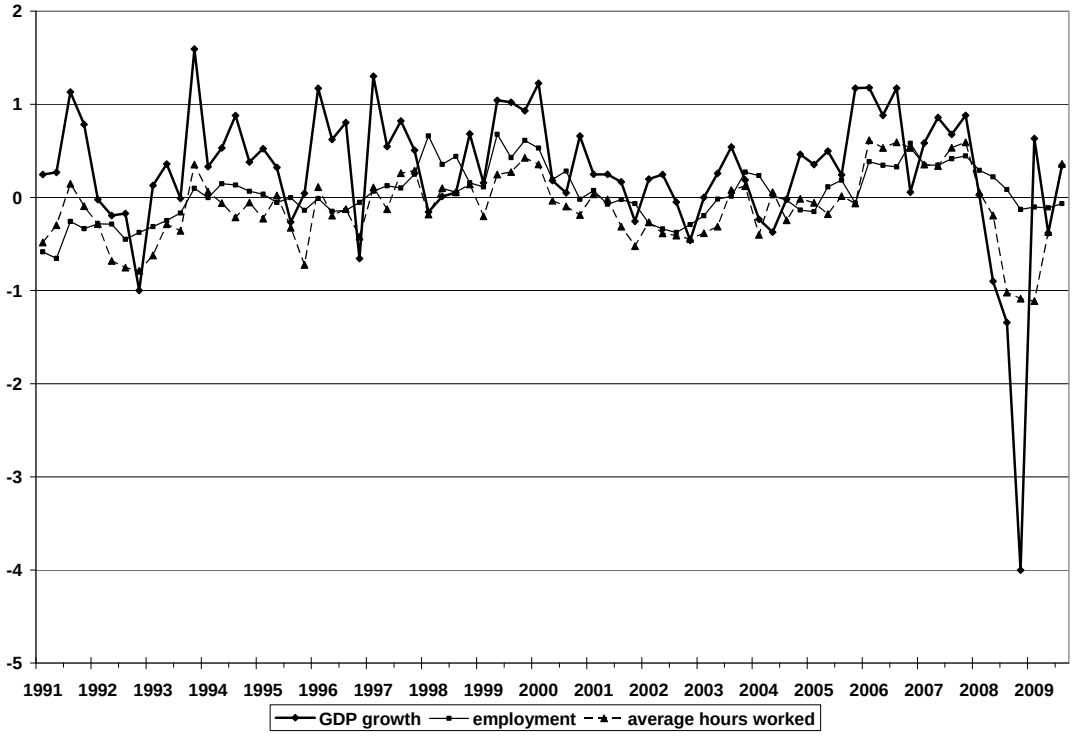
In the next chapter we take a closer look at macroeconomic figures in order to gain more evidence as to whether labour hoarding has played a significant role in times of recession in Germany and particularly during the current crisis.

3. The impact of labour hoarding and short-time work from a macro perspective

Given the sharp decrease in GDP in the fourth quarter of 2008 and the first quarter of 2009 the level of employment is still quite stable. Long-term time series show that employment and total hours worked are less volatile than output (see Chart 2), while employment measured in total hours worked is more volatile than employment measured in heads. This can also be observed by taking a closer look at the consequences of the financial crisis and is in line with our general considerations about labour hoarding. The current development is remarkable because the negative labour market responses to previous recessions were stronger and quicker.

Chart 2

GDP Growth, Employment and Total Hours Worked
1st Quarter 1991- 4th Quarter 2009
percentage changes on the previous quarter, seasonally adjusted

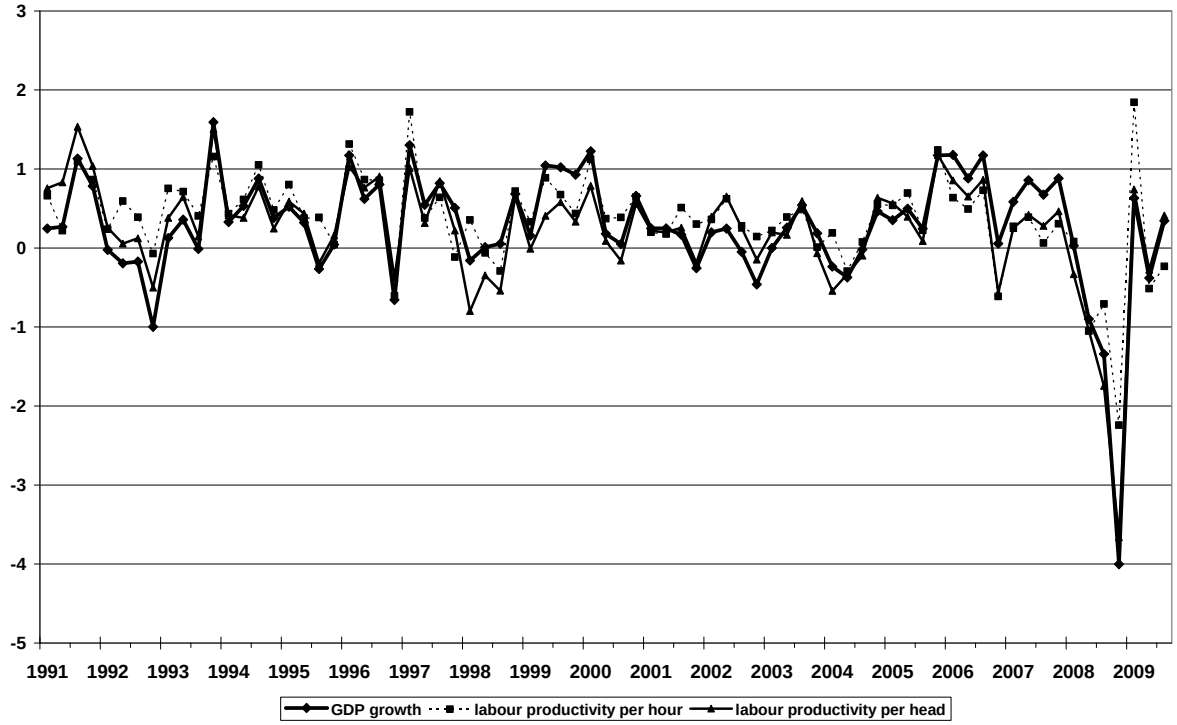


Source: Federal Statistical Office, IAB, own calculations.

There is also evidence that labour hoarding in terms of a lower utilisation of labour input has played a role in safeguarding jobs. The utilisation of labour input can be measured either in terms of labour productivity per person or of labour productivity per hour (see Chart 3). The pro-cyclical behaviour of labour productivity per person reflects the observation that employment adjusts less than output over the cycle. One reason might be that workers produce less in times of recession and more in times of economic boom (de Koning 1989, Franz 2006). Labour productivity per hour has been higher than its per-person counterpart for most of the period. An important explanation for this is the persistent downward trend in total hours worked. As a consequence of the financial crisis both labour productivity per person and labour productivity per hour have decreased significantly to levels which have never been observed before in Germany.

Chart 3

GDP Growth and Labour Productivity
1st Quarter 1991 - 4th Quarter 2009
percentage changes on the previous quarter, seasonally adjusted



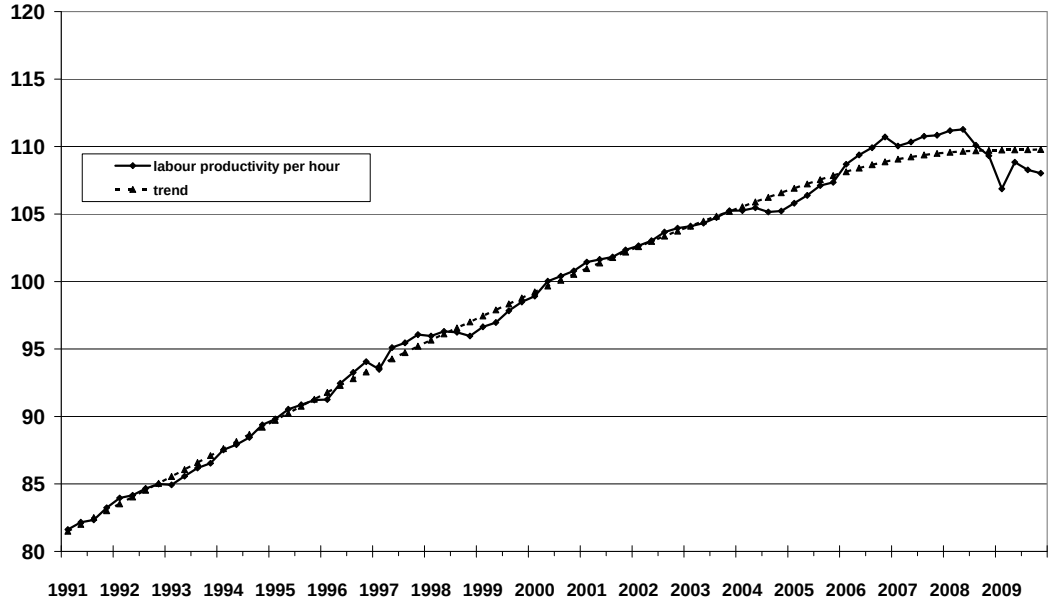
Source: Federal Statistical Office, IAB, own calculations.

In order to assess the impact that the financial crisis is having on the labour market, and particularly the role of labour hoarding, we need to ask how far below its long-run level labour utilisation is. In this respect labour productivity can be used as a proxy for labour utilisation. However, a linear trend is not necessarily a good measure of the long-run utilisation of the workforce (Felices 2003). A straight trend line might not properly represent the long-run behaviour of labour productivity. We assume that a time-varying trend is a more suitable measure for changes in labour productivity over time. A Hodrick-Prescott filter provides an estimation of such a time-varying trend (Hodrick/Prescott 1997). Using this procedure, Charts 4 and 5 illustrate whether labour utilisation is above or below its long-run level. In Charts 4a und 4b, labour productivity, measured as output per head or per hour, varies around an upward-sloping trend that could reflect its long-run equilibrium. If we assume this to be the case, then labour productivity below this line would indicate labour utilisation below its long-run trend and would therefore reflect the possibility of labour

hoarding. Conversely, labour productivity above the line reflects a more intensive labour utilisation.

Chart 4a

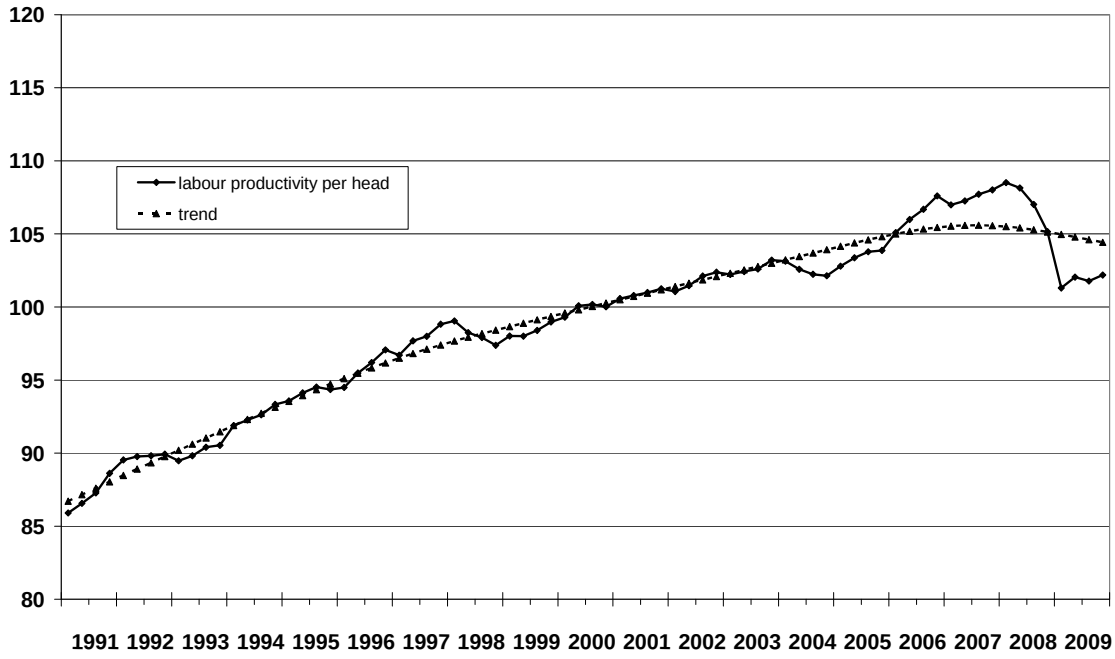
Labour Productivity per Hour: Actual and Trend*
1st Quarter 1991 – 4th Quarter 2009
Index 2000=100, seasonally adjusted



* Trend calculated using a Hodrick-Prescott filter with the smoothing parameter λ=1600.
Source: Federal Statistical Office, IAB, own calculations.

Chart 4b

Labour Productivity per Head: Actual and Trend*
1st Quarter 1991 – 4th Quarter 2009
Index 2000=100, seasonally adjusted

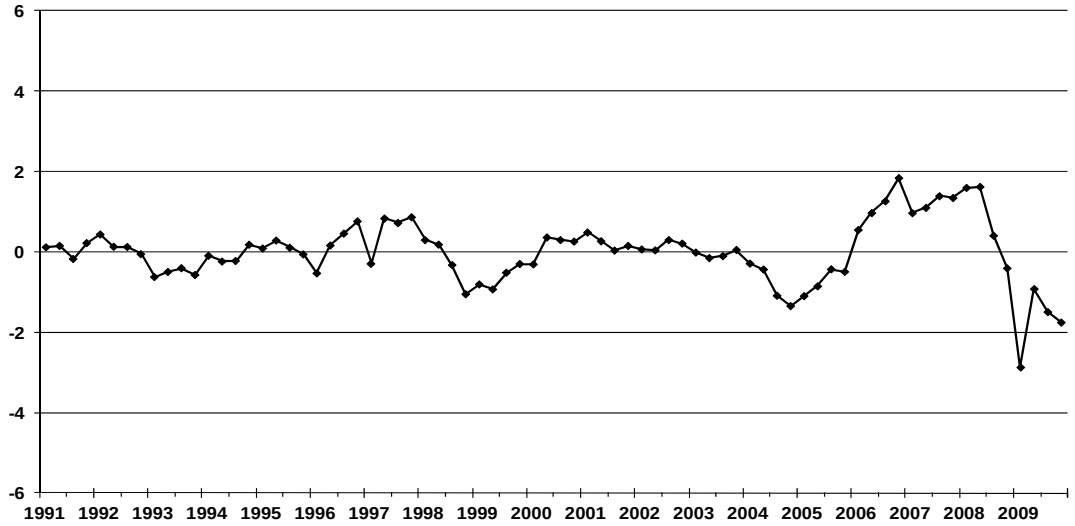


* Trend calculated using a Hodrick-Prescott filter with the smoothing parameter λ=1600.
Source: Federal Statistical Office, IAB, own calculations.

Charts 5a and 5b show the deviations between labour productivity and its fitted trend. Positive differences from the trend representing values above the zero line indicate an increasing labour intensity or labour hoarding below its long-run trend. Similarly, labour hoarding in terms of an underutilisation of the workforce occurs when negative differences from the trend can be observed. Since reunification this has happened several times (e.g. 1993 quarters I–IV, 1994 quarters II-III, 2004 quarter I– 2005 IV) but there has never been a negative deviation of labour utilisation from the long-term trend at the level which has been reached during the current crisis.

Chart 5a

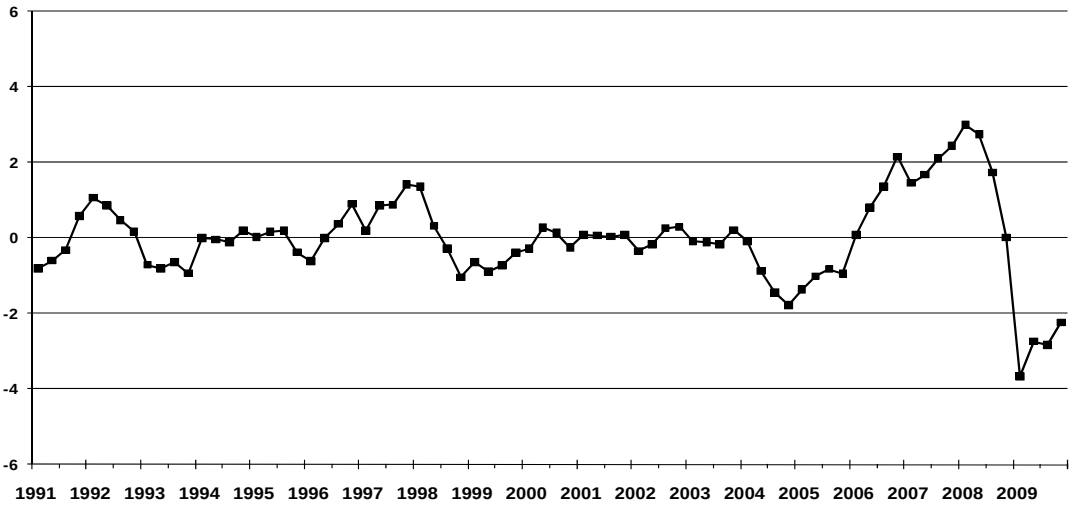
Labour Utilisation Based on Labour Productivity per Hour
1st Quarter 1991 – 4th Quarter 2009
cyclical component*, seasonally adjusted



* Cyclical component calculated using a Hodrick-Prescott filter with the smoothing parameter λ=1600.
Source: Federal Statistical Office, IAB, own calculations.

Chart 5b

Labour Utilisation based on Labour Productivity per Head
1st Quarter 1991 – 4th Quarter 2009
cyclical component*, seasonally adjusted



* Cyclical component calculated using a Hodrick-Prescott filter with the smoothing parameter λ=1600.
Source: Federal Statistical Office, IAB, own calculations.

Labour utilisation may differ significantly between industries. Using the same procedure as for the economy as a whole the analyses reveal that particularly during the current crisis we

can identify industries with either a higher or a lower level of labour being hoarded. We distinguish between three sectors (primary, secondary and tertiary sector) and five industries: manufacturing; construction; trade, hotels, restaurants and transport; finance, housing, business-related services; public and private services. The results reveal that the secondary and tertiary sectors and within these sectors particularly industries like manufacturing as well as trade, hotels, restaurants and transport have recently shown large negative deviations of labour utilisation from the long-term trend, also compared to the maximum negative deviations in the past (see Tables 2a and 2b). We can therefore assume that especially firms in these industries may have used labour hoarding in order to retain workers.

Table 2a

Cyclical Component of Labour Productivity per Head* by Industry

	2008 Q I	2008 Q II	2008 Q III	2008 Q IV	2009 Q I	2009 Q II	2009 Q III	2009 Q IV
Primary Sector	4.1	-0.1	-1.6	-2.4	4.6	-0.4	-1.8	-0.6
Secondary Sector	2.8	16.4	13.9	-5.3	-25.2	-11.8	1.1	-5.0
Manufacturing	5.8	10.5	5.1	-1.5	-15.7	-13.6	-7.7	-2.6
Construction	-3.6	5.2	8.1	-4.6	-9.5	1.8	8.8	-2.4
Tertiary Sector	0.1	6.3	7.9	-2.1	-8.8	-3.4	1.0	-4.8
Trade, Hotels, Restaurants and Transport	-1.1	4.8	4.9	-1.0	-7.3	-2.7	-0.4	-3.4
Finance, Housing and Business-Related Services	0.7	0.2	0.7	-1.7	-0.2	-0.2	0.8	-1.0
Public and Private Services	0.1	1.0	1.8	0.0	-1.4	-0.5	0.5	-0.5
All Sectors	1.8	3.3	3.0	-0.8	-5.0	-3.8	-1.3	-1.5

* Cyclical component calculated using a Hodrick-Prescott filter with the smoothing parameter λ=1600.

Source: Federal Statistical Office, IAB, own calculations.

Table 2b

Maximum Negative Deviation* (until 4th Quarter 2007)

					All Sectors:
Primary Sector		**2003 Q III:**	-14.6		0.8
Secondary Sector		**1996 Q I:**	-20.0		-2.1
Manufacturing		**2002 Q I:**	-5.4		-2.1
Construction		**1996 Q I:**	-16.9		-2.1
Tertiary Sector		**1994 Q I:**	-8.1		-1.3
Trade, Hotels, Restaurants and Transport		**2005 Q I:**	-5.4		-2.8
Finance, Housing and Business-Related Services		**2000 Q IV:**	-3.5		-0.2
Public and Private Services		**1997 Q I:**	-2.3		-2.6
All Sectors		**2005 Q I:**	-2.8		

* Cyclical component calculated using a Hodrick-Prescott filter with the smoothing parameter λ=1600.

Source: Federal Statistical Office, IAB, own calculations.

As stated earlier there are several explanations for labour hoarding. Amongst other factors the decision not to dismiss core workers may also reflect recent skill shortages in those regions or industries hit by the crisis. Indeed the German economy, particularly

manufacturing companies, suffered from a lack of highly skilled labour during the last economic upswing. So the companies are aware of an upcoming recruitment problem, expect increasing hiring costs and thus may be willing to preserve jobs in these sectors. This is even more important because the crisis is especially affecting regions and sectors which have exhibited very good labour market performance during the past years: highly competitive and export-oriented manufacturing industries (Möller 2009). These companies are often situated in prospering regions especially in the south-west of Germany, where we have experienced almost full employment during recent years. There, firms had made a profit in the last upswing and are thus able to bear the costs of labour hoarding at least for a limited period of time without danger of bankruptcy.

Changes in labour productivity used as a proxy for labour utilisation cover variations of labour hoarding to a certain extent. But there are drawbacks which need to be mentioned. Interpreting changes in labour productivity per head or per hour over time as a more or less intensive use of labour input underestimates the changing influence of non-cyclical movements in labour utilisation. Labour productivity is also affected by other factors of production, e.g. cyclical movements in total factor productivity, changes in the capital stock and its utilisation, as well as varying returns associated with different inputs (Basu/Fernald 2000). Variations in labour productivity might also be affected by the measurement of GDP. A reliable measurement of labour productivity implies being able to measure labour input properly. Aggregate output includes only regular production or marketable output and more or less neglects other meaningful work which might be important for future production, such as painting the factory, machine maintenance or internal training. This kind of work which does not normally contribute to aggregate output can be of particular importance during recessions. In some industries more labour input may be needed to sell the same amount of services, for example in logistics, or it may take the same amount of labour to serve a smaller number of people, e.g. in restaurants, theatres or cinemas. Labour productivity could therefore also decrease due to the specificities of certain tasks as well as the problems in output measurement, and not solely because of firms hoarding labour. In addition, there are problems in estimating the level of productivity per hour and per head properly. This is due to the fact that the measurement of working hours is to some extent imprecise. Because certain elements of total hours worked, such as unpaid overtime, are underreported in administrative data and surveys, cyclical variations in working hours might be underestimated in the available data.

This would imply that labour productivity per hour is overestimated in recessions and underestimated in boom periods.

Nevertheless, using labour productivity as a proxy for labour utilisation reveals that labour hoarding played a not inconsiderable role during previous recessions and is doing so in the current crisis, too. This is particularly true in certain industries such as manufacturing. All in all, we can recapitulate that the specific situation concerning the last economic upswing and the incidence of the current crisis are favourable for labour hoarding in Germany. Because the percentage deviation of labour productivity per head from the long-term trend is much higher than its per-hour counterpart, the reduction of working hours has obviously been an additional significant factor for safeguarding jobs.

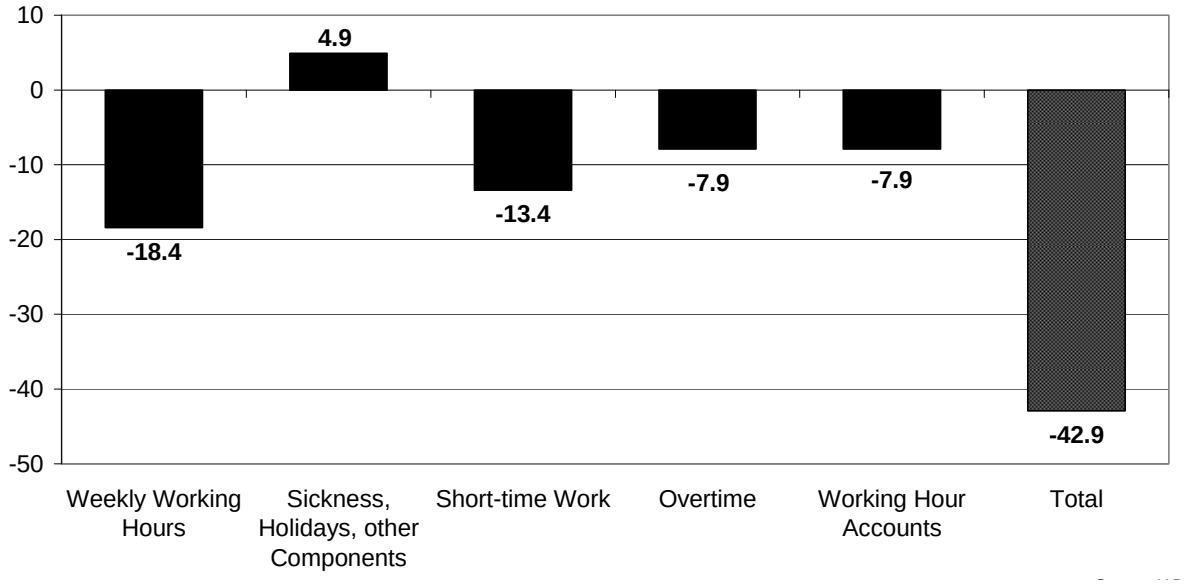
Given the different costs of external flexibility, firms face incentives to increase internal work flexibility by varying working hours or the intensity of labour input over the business cycle. Indeed companies have increasingly created internal schemes in order to react more flexibly with respect to short-run fluctuations, e.g. the use of working-time accounts has become more and more important (Bellmann/Gerner 2010). Working-time accounts allow for increasing working hours during times of high demand – these hours saved by the employees act as a buffer stock which can be spent to reduce working time during periods of lower activity. In doing so, real labour costs are shifted from a period of high production activity to a period of low production activity. This guarantees a stable income for workers facing fluctuations in their working hours. Working-time accounts come to a natural end when they are empty. In addition, so-called *alliances for jobs* at the company level or collective agreements aim at safeguarding jobs by allowing a joint reduction of working time and pay (Bellmann/Gerner 2010)

The decomposition of the total change in working hours of salaried workers from 2008 to 2009 by the Institute for Employment Research (IAB) indicates that four components were especially relevant. Shorter weekly working hours (minus 18.4 hours a year) were of the greatest importance. Collective agreements and firm-specific alliances for jobs allow longer working hours during peak periods of demand and shorter hours during recessions on condition that the contracted working time is maintained on average over a defined period. The second most important component was the strong use of short-time work, which amounts to minus 13.4 hours a year. A reduction of paid overtime (minus 7.9 hours a year) and a phasing down of working-time accounts (minus 7.9 hours a year) additionally contributed to the reduction of average working hours in 2009 (see Chart 6). The decomposition suggests

that subsidised labour hoarding such as short-time work certainly helps to explain the strong reduction of working hours but it is not the major explanation.

Chart 6

Changes in Working Hours per Year in Germany, 2009
- yearly averages, changes in hours -



Source: IAB.

The calculated impact of short-time work on working hours per year is based on the use of the scheme. In 2009 an average of about 1.1 million people worked short-time. This was the highest number since the early 1990s, when short-time work was used as an instrument to dampen the structural consequences of German unification. Short-time work[3] is currently being used most intensely in manufacturing and in western Germany, in highly competitive sectors and thus serves more as an instrument to counter cyclical movements and not structural changes. So in the current crisis firms are using subsidised short-time work as a means to partly finance labour hoarding and bridge the crisis, making their workers return to their regular jobs. By contrast it was used as an additional instrument of the social security network following German unification in the 1990s.

Based on an average loss of 36 per cent of the working time, the amount of short-time work corresponds to about 340,000 full-time employees in 2009 (own calculations based on IAB 2010). As some of the short-time workers are employed on a part-time basis, the calculated effect of short-time work on safeguarding employment is likely to be slightly higher. Full-

[3] Please note: we are not able to distinguish between the three types of short-time work.with the available data.

time equivalents are often put on a level with their impact on the labour market. But this equation overestimates the incremental employment effects of the programme. It fails to take windfall gains into consideration. A certain amount of displacement can take place, as both viable and non-viable firms are supported during the crisis. In addition, it also assumes that the only alternative to short-time work is non-employment and disregards the possibility that in some cases dismissals may not be avoided by means of short-time work but only postponed (Kruppe/Mosley 1996).

Two crucial issues for an assessment of short-time work are the extent to which it could have been substituted by non-subsidised types of labour hoarding and the relevance of displacement effects. These issues can, of course, not be answered using macro data. In the following section we therefore use micro data and take a closer look at subsidised and non-subsidised labour hoarding at the firm level.

4. Labour hoarding and short-time work at the firm level

To investigate the extent to which firms suffering from a recession hoard labour, we use data from the IAB Establishment Panel for the period from 2002 to 2004 (see also Box 1). The development of sales volume and the employment of firms during a period of economic downturn are of special interest in this respect. We took these data for two reasons. Firstly, we wanted to come as close as possible to the last recession, which took place from 2002 to 2003 (Räth 2009). For obvious reasons firm data until 2010/2011 are not available at present. Secondly, we will later add some further information about establishments using short-time work and those not doing so. This information is available for the 2003 survey period of the IAB Establishment Panel.

Box 1: The IAB Establishment Panel

The IAB (Institute for Employment Research) Establishment Panel is an annual survey of establishments. It represents all industries and establishment sizes nationwide and can also be analysed on a longitudinal basis. The survey was initiated in western Germany in 1993. Besides firms' structure information, such as economic activity, it contains information about sales and intermediate inputs per year, employment levels as of June of each year and information about short-time work for the year 2003 (Fischer et al. 2009).

First we have to identify establishments with a considerable decrease in sales volume. We use the following definition: a considerable decrease in sales volume is given when the firm

would have been able to keep the sales volume per employee constant in 2002 by laying off at least one employee.[4] This group consists of around 17 per cent of all establishments with about 34 per cent of all employees. We then divided these establishments into two sub-groups: the first group maintained or even increased their employment levels, whereas the second group decreased the number of employees between June 2002 and June 2004[5] (see Table 3). A good half of the establishments suffering from a considerable reduction in their sales volume increased their number of employees or kept it constant. Because of decreasing sales from 2002 to 2003 and the either constant or increasing level of employment during the period June 2002 to June 2004, these firms are most likely to have been hoarding labour because their output-labour ratio measured in output per employee decreased.[6] For the other sub-group of establishments facing a considerable decline in sales volume the employment decisions point in the same direction – the number of employees fell.

Table 3

Changes in Employment in Establishments with a Considerable Decrease in Sales Volume

Establishments with a considerable decrease in sales volume 2002 – 2003 (17% +/- 1.5% of all establishments with 34% of all employees in 2002)* *Share of the number of establishments (share of all employees) in this group*	
Labour hoarding June 2002 – June 2004 53% +/- 3.2 % (40%)	Decline in employment June 2002 – June 2004 47% +/- 3.2% (60%)

*Notes:
(1) 42% +/- 1.8 % of the establishments in the sample had slightly decreasing, constant or increasing sales. For 41 % +/- 1.8 % of all establishments in the sample there is no information about changes in sales volume, short-time work, and/or changes in employment.
(2) Weighted shares with an estimated 95% confidence interval for the number of establishments (taken from Fischer et al. 2008).
Source: IAB Establishment Panel, own calculations.

[4] This definition is, of course, debatable. It obviously has different implications for large and small establishments. We thus conducted a sensitivity analysis using an alternative definition: a reduction was regarded as considerable if the decrease in sales volume exceeded 10 per cent. The results do not show significant differences from the analysis presented in the paper.
[5] We took the level of employment in June 2002 as a proxy for the starting point of the observation at the beginning of 2002 and the level of employment in June 2004 for the final point of the observation at the end of 2003.
[6] While we considered the volume of work in our previous definition of labour hoarding we have to refer to the number of employees here, because the data do not contain sufficient information about the hours worked.

If we look at different industries we see some variation. In the tertiary sector (services) the share of establishments with considerably decreasing sales which showed signs of labour hoarding is higher. In the secondary sector (manufacturing and construction) the opposite is the case. A larger number of establishments with decreases in sales reduced their employment.[7]

Additionally, we can show that small establishments with a considerable drop in sales volume are more likely to maintain or increase the number of employees (Table 4). The data also allow us to consider the development of shares of part-time workers, temporary workers, skilled and unskilled workers as proportions of the total workforce. However, further analyses gave no clear evidence as to how establishments with decreasing sales make use of labour hoarding.

The recession in 2002/2003 was not as pronounced as the current one. The results for the current recession would probably be more definite. Additionally, to gain more information about companies which hoard labour, future analyses could link data containing details on employees.

Table 4

Changes in Employment in Establishments with a Considerable Decrease in Sales Volume by Size Class

Establishments with a considerable decrease in sales volume 2002 – 2003 *Labour hoarding and decline in employment by size class* *(Share of all establishments in the corresponding size class)*		
Size class	Labour hoarding	Decline in employment
1 – 9 employees	63% (+/- 8%)	37% (+/-8%)
10 – 49 employees	45% (+/-5.7%)	55% (+/-5.7%)
50 – 249 employees	36% (+/-6.2%)	64% (+/-6.2%)
250 or more employees	33% (+/- 6.7%)	67% (+/-6.7%)

Note: Weighted shares with estimated 95% confidence intervals for the number of establishments (taken from Fischer et al. (2008, p. 37).

Source: IAB Establishment Panel, own calculations.

[7] Weighted shares and 95 % confidence intervals for the sectors are: 57% +/-4.4% of all establishments in the tertiary sector tended to hoard labour. 57% +/-5.3% of all establishments in the secondary sector reduced the number of their employees. Due to the large confidence interval there is no clear result for the employment changes in firms in the primary sector which suffered from decreases in sales volume: 55% +/- 14% of the establishments tended to hoard labour.

In a subsequent step we combined our results with information about the use of short-time work in the first six months of 2003. An important goal of the short-time work scheme in Germany is to dampen undesirable effects of recessions on employment.

But what firms do make use of short-time work? Can we assume that they are exclusively firms that are suffering from a recession or do we also observe firms with increasing sales? There is not much information on this concerning the period of recession from 2002 to 2003 (Deeke 2005). Crimmann/Wießner (2009) found a negative correlation between qualitative assessments by firms concerning their revenues in *2002* and the probability of using short-time work, and a positive correlation between negative business expectations for 2003 and the probability of using short-time work. We are able extend this view by examining how the employment levels and the sales volume of firms using short-time work have developed.[8] Nevertheless, the share of establishments using short-time work was quite small in the first six months of 2003, at only 2 %. For this reason the following results should be interpreted with caution. With regard to the industries it can be shown that in the first six months of 2003 short-time work was mostly used by the secondary sector (Table 5), although the tertiary sector comprises the largest number of establishments and employees.

Table 5

Use of Short-time Work in the First Six Months of 2003 by Sector

All sectors	Primary sector	Secondary sector	Tertiary sector
Yes (2%)	1%(-)*	55% (+/- 9.9%)	44% (+/-9.9%)
No (98%)	4% (+/-1.0%)	21% (+/-1.9%)	75% (+/-1.9%)

*Number of establishments observed is too small.
Note: Weighted shares with estimated 95% confidence intervals for the number of establishments (taken from Fischer et al. (2008, p. 37).
Source: IAB Establishment Panel, own calculations.

An interesting question, however, is to what extent companies with varying sales volume trends have made use of short-term work. In this respect Table 6 displays two findings. On the one hand establishments which were not suffering from considerable losses of sales volume and used short-time work were more likely to have a steady or increasing level of employment afterwards than those which showed a decline in employment between June 2002 and June 2004. This does not rule out the possibility that some of these firms were

[8] We pay for our dynamic perspective with a (further) loss of observed establishments relative to the population. This is partly compensated by supporting *panel extrapolation factors*. These factors can be used for descriptive structural analysis under certain conditions, but the findings may be imprecise (Fischer et al. 2008). However, in the following they are presented for illustration purposes.

suffering from economic difficulties, so the use of short-term work may be justified. But especially in the case of increasing sales one has to ask whether the firm itself should be responsible for the necessary adjustments and not the state. On the other hand most of the establishments using short-time work and suffering from a considerable decrease in sales volume had reduced their workforce. However, the latter finding may suggest, but does not necessarily mean, that short-time work has had no impact at all: without public aid there may have been even more lay-offs. To investigate this issue, however, a counterfactual situation would be needed implying that short-time work had not been used by a certain establishment. This situation is neither theoretically nor empirically constructible and therefore there is no clear evidence of whether short-time work has dampened the decline in employment or has had no effects on its development.

Table 6

Establishments with Short-time Work in the First Six Months of 2003 by Sub-group

Establishments with slightly decreasing, constant, or increasing sales volume 2002 – 2003	Steady or increasing employment	33%(+/-9.5%)
	Decline in employment	19%(+/-8.0%)
Establishments with a considerable decrease in sales volume 2002 – 2003	Labour hoarding	2%(-)*
	Decline in employment	45%(+/-10%)

*Number of establishments observed is too small.
Note: Weighted shares with estimated 95% confidence intervals for the number of establishments (taken from Fischer et al. (2008, p. 37).
Source: Differentiation on the basis of Frick (2005), data from the IAB Establishment Panel, own calculation.

We conclude that a not inconsiderable share of German establishments that were affected by the recession in 2002/2003 already tended to hoard labour. Unfortunately, it is not known whether short-time work stabilised employment or not. Furthermore, the use of short-time work obviously does not depend solely on the economic situation of the establishment. Therefore, also firms with increasing or at least constant sales as well as stable employment used short-time work. One possible reason for this might be that the scheme was not targeted properly. This could be avoided in two ways: (1) better conditions for firms suffering from a difficult economic situation and (2) restricted access to short-time work for firms in a more favourable economic situation. In the current recession the first aspect may already have been taken into account by subsidising social security contributions in the case of downtime (Bach et al. 2009). But this does not exclude the possibility that recently firms in a more favourable

situation have again used the instrument. For this reason, stricter regulations concerning the economic situation of a firm should be considered.

5. Conclusions

As a consequence of the global financial crisis Germany has experienced the deepest slowdown of its economy since World War II. However, at least up to now the German labour market has not shown a strong reaction to the financial crises. Given the sharp decrease in GDP the levels of employment and unemployment are still quite stable. German companies continue to face stringent regulations for standard work arrangements, so atypical and more flexible work arrangements have gained importance during recent years. These work arrangements provide external flexibility at least to a certain degree and are accompanied by a set of measures aimed at internal flexibility within the core workforce. Both strategies facilitate adaptation to macroeconomic shocks and form a protective shield against job losses among the core workforce, which is responsible for the stability of the German labour market until the beginning of 2010.

One of the potential sources of internal flexibility is labour hoarding, which means that firms do not immediately adjust labour input in line with demand for their products. Our paper indicates that labour hoarding has been of certain relevance for the German labour market in times of economic slack. This is particularly true of the current crisis. But in general, labour hoarding is not a ‘silver bullet’ at all. It has certain limitations, especially due to output uncertainty. When the crisis is deep and long, there are particular risks – a firm’s ability to bear the costs of labour hoarding declines and lay-offs become more reasonable. Other side effects of labour hoarding may include a lower level of labour turnover, a slowdown of structural change or the risk of jobless growth in the next economic upswing. Recent surveys indicate that companies which are affected by the crisis state that their most important response to a lack of demand is to reduce hiring (Heckmann et al. 2009). For outsiders the combination of labour hoarding and a reduction of recruitments may result in serious problems in entering the labour market. Indeed an analysis of labour market flows shows that there are only few entries to the labour market at the moment (Rothe 2010). This problem will probably continue to exist throughout the crisis and extend into the following economic upswing, as internal and external flexibility operate in both directions. Employment reactions are weaker both in the recession and also in the upswing: firms will first increase the intensity of labour input, engage staff in working overtime and restock the working-time

accounts. In a second step they will recruit new staff, possibly on a temporary basis at the beginning. So a period of jobless growth is likely after leaving the current crisis, which bears higher risks of human capital deviation and long-term unemployment.

There is also some evidence that short-time work has contributed to labour hoarding. Nevertheless, firm data covering an earlier recession show that short-time work was also used by firms which were not suffering significantly from an underutilisation of their capacities. This cannot be ruled out at all in the case of the current crisis, especially with regard to the reforms leading to more generous short-time work schemes. Companies decide about labour hoarding according to a cost-benefit ratio which in general does not include the social costs of labour hoarding. Additional costs for the state may result, e.g. if short-time workers are dismissed later on anyway or if firms could have done without public aid. In addition, generous short-time work schemes bear the risk of conserving structures or rescuing companies which are no longer competitive. Because of these side effects, effective targeting measures for short-time work are important.

The aim would then be to restrict access to the subsidies and spend the money on the "right" companies. In order to minimise windfall gains, schemes may therefore impose special conditions. Nevertheless, there is a problem at that point in time when the decision for or against short-time work has to be made: neither the firm nor the state know whether the firms' negative business expectations will become true. One solution could be a combination of short-time work with a clause for repayment in the case of an (unexpected) good economic situation from an *ex-post* perspective. An even more radical strategy would be to rely solely on functional equivalents such as an even more intensive use of flexible work schemes within firms.

Our paper is only a starting point for further analyses. It will be necessary to take a more careful look at more recent firm data in the near future covering the period between 2009 and 2011 and examine whether there are still indications of windfall gains. The analyses could be deepened further by linking firm data with employee data in order to identify determinants of labour hoarding with a (micro-)econometric approach.

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