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Beyond Collective Agreements: The Rise of the Wage Cushion in Germany

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Beyond Collective Agreements: The Rise of the Wage Cushion in Germany*

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Abstract: Representative establishment data reveal that over 60% of German plants covered by collective agreements pay wages above the level stipulated in the agreements, creating a wage cushion between actual and contractual wages. While collective bargaining coverage has fallen over time, the prevalence of wage cushions has increased, particularly in eastern Germany. Cross-sectional and fixed-effects analyses for 2008-2023 indicate that in western Germany the presence of a wage cushion is mainly related to plant profitability, unemployment, vacancies, and the business cycle. Plants which apply collective agreements at the firm rather than the sectoral level are less likely to have wage cushions since firm-level agreements make it easier to explicitly take firm-specific conditions into account. In eastern Germany, however, the explanatory power of these variables is much lower. Against the backdrop of falling bargaining coverage, the increasing prevalence of wage cushions suggests that the traditionally rigid German system of wage determination has become more flexible and differentiated.

Zusammenfassung: Repräsentative Betriebsdaten zeigen, dass über 60% der tarifgebundenen Betriebe in Deutschland Löhne zahlen, die über dem in Tarifverträgen festgelegten Niveau liegen, wodurch ein Lohnpuffer zwischen den tatsächlichen und den vertraglich vereinbarten Löhnen entsteht. Während die Tarifbindung im Laufe der Zeit zurückgegangen ist, hat die Verbreitung der übertariflichen Entlohnung zugenommen, besonders in Ostdeutschland. Querschnitts- und Fixed-Effects-Analysen für 2008-2023 zeigen, dass in Westdeutschland das Vorhandensein eines Lohnpuffers hauptsächlich mit der Rentabilität des Betriebs, der Arbeitslosigkeit, offenen Stellen und dem Konjunkturzyklus zusammenhängt. Betriebe, die Tarifverträge auf Betriebs- statt Branchenebene anwenden, zahlen seltener über Tarif, da es bei Firmentarifverträgen einfacher ist, betriebsspezifische Bedingungen ausdrücklich zu berücksichtigen. In Ostdeutschland ist der Erklärungswert dieser Variablen jedoch erheblich geringer. Vor dem Hintergrund der sinkenden Tarifbindung deutet die zunehmende Verbreitung von Lohnpuffern darauf hin, dass das traditionell starre deutsche System der Lohnfindung flexibler und differenzierter geworden ist.

JEL Classification: J30, J31

Keywords: wage determination, collective bargaining, wage cushion, Germany

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1. Introduction and institutional background

Traditionally, the German system of wage setting has been regarded as rather centralised, all-encompassing and rigid, with most plants and workers covered by collective bargaining agreements at sectoral level that determine contractual wages (and finally effective wages). However, there are clear signs that wage setting has undergone substantial change in the last decades, and this also applies to the entire system of industrial relations in Germany (see, e.g., Addison et al., 2017; Oberfichtner and Schnabel, 2019; Jäger et al., 2022). Much attention has focused on the massive decline in plants' collective bargaining coverage in Germany, which more than halved in the last 25 years (see, e.g., Kohaut and Schnabel, 2003a; Addison et al., 2016; Hohendanner and Kohaut, 2024). In contrast, there is not much recent evidence on the wage setting behaviour of those plants that are still covered by collective agreements. In particular, we do not know whether and to which extent these employers stick to the contractual wages negotiated in collective agreements or pay actual wages that are higher than stipulated in the relevant collective agreement, which used to be common practice (Jung and Schnabel, 2011). Using the IAB Establishment Panel, a representative annual survey of about 15,500 establishments in Germany, this paper overcomes this information and research deficit. We focus on plants that are bound by collective agreements and analyse their difference between actual and contractual wages and its determinants.[1]

In Germany, the principle of bargaining autonomy gives unions and employers the right to regulate wages and working conditions without state interference. They negotiate regional or nationwide collective agreements that are legally binding and may be set up either as multi-employer agreements at sectoral level or as single-employer agreements at plant level. Collective agreements determine pay (usually annually) as well as job classifications, working time and working conditions (over longer time periods). Companies may decide to be covered by these agreements, but they can also abstain from collective bargaining with unions and negotiate wages individually with their workforce. If companies are bound by (single- or multi-employer) collective agreements, they cannot undercut, only improve upon the minimum terms and conditions laid down in

[1] Although it might also be interesting to analyse (downward) deviations from collective agreements via "opening clauses", which enable employers and the workforce in certain plants to adapt to plant-specific situations, recent information on the existence and use of these opening clauses is lacking (the corresponding question in the IAB Establishment Panel was last asked in 2011). Moreover, in Germany opening clauses are mostly used for firm-specific working time agreements, but less so (and usually only in cases of emergency) for lowering wages. For details, see Kohaut and Schnabel (2007), Brändle and Heinbach (2013), Ellguth and Kohaut (2014a) and Addison et al. (2017).

these agreements. For instance, they may offer longer holidays or they pay higher wages than stipulated in the collective agreements (for institutional details, see Jäger et al., 2022 and Hirsch et al., 2022).

The difference between the level of contract wages laid down in the relevant collective bargaining agreement and the higher level of actually paid (i.e. effective) wages in an establishment is termed the "wage cushion".[2] Unfortunately, there are no official statistics on the presence and the size of this wage cushion in Germany. The last official survey on the levels of contractual and actual wages was conducted in 1962 (Decken, 1964), and the German Federal Statistical Office nowadays only publishes indices of the development of contractual and actual wages. To overcome this deficit, a number of older studies have analysed various company surveys that provide the relevant information (see, e.g., Meyer, 1995 and Bellmann and Kohaut, 1995 for western Germany, Kohaut and Schnabel, 2003b and Jung and Schnabel, 2011 for united Germany). The most recent, purely descriptive analysis by Ellguth and Kohaut (2014b) relates to the year 2013. It shows that in western (eastern) Germany 39 (24) percent of those private sector companies that were bound by collective agreements paid wages above the level stipulated in their agreement and that the size of this wage cushion was about 10 percent. The last econometric analysis by Jung and Schnabel (2011) finds that in the observation period 2001-2006, the wage cushion mainly varied with the profit situation of a plant and with indicators of labour shortage and the business cycle.[3]

This paper will provide an up-to-date analysis of the factors associated with the existence and the size of a wage cushion in individual establishments, contributing to the literature in three ways: First, using representative panel data for plants in Germany that cover the period 2008 to 2023, we document that the share of plants which pay wages above the level stipulated in the collective agreement has substantially increased over time. It is higher in western than in eastern Germany and it is lowest in small plants with less than ten employees.

[2] The expression "wage cushion" has come into use to overcome certain ambiguities in terminology found in the older literature (see Cardoso and Portugal, 2005; Bastos et al*.,* 2009, Jung and Schnabel, 2011). The older literature often uses expressions like "wage drift" (see, e.g., Gould, 1967; Ordine, 1996) or "wage gap" (see Gerfin, 1969) for the phenomenon studied here.

[3] Similar to Germany, wage cushions are usually found in rather centralised systems of wage setting, and there exist a number of studies analysing the determinants of wage cushions and their developments over time (i.e. wage drift) in several countries. See, e.g., Holden (1990), Holmlund and Skedinger (1990), and Hibbs and Locking (1996) for the Nordic countries, Ordine (1996) for Italy, Cardoso and Portugal (2005), Bastos et al. (2009) and Card and Cardoso (2022) for Portugal, Palenzuela and Jimeno (1996) and Domínguez and Rodríguez Gutiérrez (2016) for Spain as well as López Novella and Sissoko (2013) for Belgium.

Second, we econometrically analyse the major determinants of the existence and size of the wage cushion. In addition to standard predictors found in the extant literature like the size and profit situation of a plant (e.g., Jung and Schnabel, 2011), we include new factors like company revenues, the owner-management of a plant and non-statutory forms of worker representation. Due to lack of data, the latter two potential determinants could not be investigated in previous analyses. We also check whether the introduction of a statutory minimum wage in Germany in 2015 has affected the wage cushion.

Third, we analyse whether the major covariates of the wage cushion are consistent with various explanations derived from alternative theories of wage determination. For instance, a specific hypothesis to be tested is that by bargaining at the plant level rather than at the sectoral level firms can better take into account the firm-specific situation so that the wage cushion should be considerably lower in such companies. Other hypotheses, which have not been tested so far, are that plants which are fully or partly managed by the owners are more hesitant to pay wages above the contractual level, and that the presence of wage cushions increases with the size of company revenues (which might reflect rent-sharing).

Looking at bargaining coverage, the presence of a wage cushion and the fraction of firms affected provides some interesting information on the relative importance of (multi- or single-employer) collective wage bargaining by trade unions and employers' associations on the one hand and of the determination of actual wages by individual companies on the other. As a wage cushion reflects differences in actual wages between different plants, employees and regions (within the same bargaining unit), its size and development can be interpreted as an indicator of wage differentiation and wage flexibility in the German system of wage determination, which is often regarded as rather rigid. More general, analysing the wage cushion will improve our understanding of the functioning and future prospects of the German system of wage determination. As actual wages above the negotiated wage rates – and thus wage cushions – are also found in many other European countries like Spain, Portugal, Italy, Belgium and some of the Nordic countries, there also may be some general lessons that can be drawn from a study of Germany (see also Card and Cardoso, 2022).

The paper proceeds as follows: Section 2 provides some theoretical considerations on the determinants of the wage cushion and sketches extant evidence for Germany. Descriptive evidence on the existence and size of the wage cushion in western and eastern Germany is given in Section 3. Section 4 presents the results of our econometric analysis, and Section 5 concludes.

2. Theoretical background and extant evidence

The relatively sparse literature on the wage cushion is consistent with five theoretical approaches (although not all of these directly refer to the wage cushion).[4] The traditional *market approach*, which can be traced back to the 1950s (e.g., Hansen and Rehn, 1956), stresses the role of market forces in shaping the wage cushion. Based on the neoclassical theories of labour supply and demand, the wage cushion is interpreted as the result of excess demand for labour. If there is a labour shortage in a certain segment of the labour market or in the aggregate labour market, the actual wages paid will increase whereas contractual wages may not react so swiftly. Such an outcome will be particularly likely in times of full employment (see also Külp, 1965). In this approach, outside factors such as aggregate or regional unemployment are regarded as the most important determinants of the wage cushion whereas factors inside the company should not be important.

Market forces and the labour market situation are also relevant in *bargaining theories* of the wage cushion insofar as they affect the opportunities of employers and employees at the company level. Additionally, all other factors that may influence the profits and utility of employers and employees and their bargaining positions are taken into account. Bargaining models typically take the contractual wage determined in multi-employer agreements at the sectoral level as given and interpret wage setting at the company level as a result of company-specific bargaining between employers and trade unions (see, e.g., Holden, 1990). Actual wages will be higher than laid down in sectoral agreements if the economic situation and the ability to pay of the company are better than assumed in sectoral bargaining or if the bargaining position of workers at company level is better than at sectoral level. In Germany, this reasoning needs some modification since here the interests of employees at company level are usually represented by works councils, which by law are excluded from reaching agreement with the employer on wages (unless a sectoral agreement explicitly authorizes such a plant-specific deviation). However, works councils' extensive rights of information, consultation and co-determination on many other issues imply that they have

[4] This brief description partly follows and extends Jung and Schnabel (2011). For more detailed discussions, see Külp (1965) and Schnabel (1997: ch. 6). Note that the various explanations are not mutually exclusive. Muysken and van Veen (1996), for instance, present a model combining efficiency wage and bargaining explanations of the wage cushion.

considerable bargaining power which can be used for rent-seeking and pushing through higher actual wages (see, e.g., Addison et al., 2001; Hübler and Jirjahn, 2003).[5]

In contrast to the previous explanations, which assume that companies are compelled to pay higher wages by the market or by the bargaining power of their workforce, the *efficiency wage approach* (see, e.g., Weiss, 1991) implies that the wage cushion is an instrument of personnel policy voluntarily applied by firms to stimulate labour productivity. If they are incompletely informed about the motivation and effort of their workers, companies may be willing to pay higher wages than stipulated in collective agreements to attract better qualified workers, avoid costly quits, reduce shirking and better motivate their workforce. The resulting efficiency wage and thus the size of the wage cushion is the outcome of companies' profit-maximizing behaviour. It reflects the determinants of employee effort such as the labour market situation, the level of alternative wages or the profitability of the firm (if firms pay wage premia in times of high profits and employees regard this as fair).

In a new, slightly different perspective that is compatible with the last two approaches discussed above, the wage cushion can also be interpreted as the outcome of *rent sharing*.[6] Rent sharing theories assume that under imperfect competition companies earn rents (i.e. profits above the level resulting from paying all production factors their market rates), and these rents or surpluses can be shared with the workforce. The size of workers' share and thus the wage cushion may depend on their bargaining power (as in the bargaining approach), but it can also reflect companies' strategic decision to pay wage premia because of efficiency wage considerations. Furthermore, the extent of rent sharing may depend on the ownership of the company. Although it has been shown that plants which are managed by the owner(s) are more hesitant to adopt collective bargaining (see Kölling and Schnabel, 2021), probably because owners want to remain the ultimate boss in the establishment (Jirjahn and Mohrenweiser, 2016; Müller and Stegmaier, 2020), it is an open question whether such a behaviour carries over to rent sharing in plants covered by collective agreements, in such a way dampening the existence and the size of wage cushions.

Finally, in the *institutional approach*, the wage cushion is regarded as a mechanism to overcome the constraints imposed by multi-employer collective bargaining, giving

[5] Instead of resulting from explicit bargaining, the wage cushion could also be modeled as the result of anticipated or implied negotiations where – to save transaction costs – an employer anticipates the results of an individual negotiation with an employee (Pull, 1996). In this case, a wage cushion can even exist in the absence of trade unions or works councils at plant level.

[6] For the relevance of rent-sharing in Germany, see Guertzgen (2009) and Hirsch and Müller (2020). Interestingly, however, both studies do not explicitly focus on the wage cushion.

companies some room for manoeuvre in wage-setting (see Cardoso and Portugal, 2005). Collective agreements contain a limited number of wage brackets for job classifications that are mainly based on formal qualification and tasks. These brackets serve as a kind of minimum wages for employees who fall in the respective classifications. Companies that need to differentiate further or intend to overcome the wage compression resulting from an egalitarian union wage policy can only do so by paying wages that lie above the minimum stipulated in multi-employer agreements (or by switching to single-employer or no collective bargaining). Moreover, as bargaining in Germany is relatively centralized, collective agreements are not able to take into account the specific situation of individual companies. Flexible wage cushions are thus important in allowing wages to vary between more and less profitable companies that are covered by the same multi-employer agreement (Card and Cardoso, 2022).

Although these five approaches are helpful in shaping the theoretical background of wage cushions, it is quite challenging to distinguish empirically between alternative theoretical explanations. The problem is that these approaches are not mutually exclusive and that some potential determinants such as the labour market situation and company profitability play a role in various explanations of the wage cushion. For instance, the majority of previous empirical analyses of the wage cushion in Germany found that the state of the labour market (measured by unemployment rates, vacancies or other indicators) is significantly related to the wage cushion (see, e.g., Meyer, 1995; Bellmann and Kohaut, 1995; Kohaut and Schnabel, 2003b; Jung and Schnabel, 2011), which is consistent with the first three theoretical explanations discussed above. Also, company profitability has been found to be positively associated with the wage cushion in some studies (see Kohaut and Schnabel, 2003b; Jung and Schnabel, 2011), but this result is consistent with three different theoretical approaches. In contrast, the finding by Meyer (1995) and Addison et al. (2001) that the wage cushion is significantly higher in plants where managers regard higher wages as an instrument for increasing employee motivation clearly points to efficiency wage theory. Finally, Kohaut and Schnabel (2003b) and Jung and Schnabel (2011) obtained some evidence for the relevance of the institutional approach in Germany.

3. Data and descriptive results

Although the Federal Statistical Office in Germany does not provide statistics on bargaining coverage and the wage cushion, this information can be obtained from the representative IAB Establishment Panel (for detailed descriptions of this data set, see

Ellguth et al., 2014; Bellmann et al., 2024). Since 1993, the IAB Establishment Panel has surveyed plants from all industries using a stratified random sample of all establishments that employ at least one worker covered by the German social security system at the 30th June of a year. Over time the number of establishments interviewed increased to about 15,500, in order to allow regional analysis at the federal state level. The data are mainly collected in personal interviews with the owner or management of the plant. The interviewed plants have been shown to be representative of the underlying official administrative population (Bossler et al., 2018).

As the IAB Establishment Panel has been set up for the needs of the Federal Employment Agency, detailed information on the number of workers, the composition of the workforce and its development through time constitutes a major part of the questionnaire. Further questions include information on wages, profitability, industrial relations, production technology, establishment policies, the plant's ownership, and general information about the plant. Most important for our analysis, establishments are also asked whether they are covered by collective agreements and whether they pay wages above the level stipulated in these agreements. If they do pay such wage premia, they were asked (only until 2016) to report the average deviation of actual wages from contractual wages in percent, which is the definition of the wage cushion we will use. Finally, plant management was also asked which proportion of workers benefit from such wage premia (only in 2013-2016).

The IAB Establishment Panel provides various data relevant for our topic from 2007 or 2008 onwards, so that our observation period covers the years 2008 to 2023. We report cross-section weighted results for the shares of plants (not firms) and workers which are covered by collective agreements and pay wages above the level stipulated in these agreements. Following Hohendanner et al. (2015), we can distinguish between the private and public sector and then exclude the latter since public employers regard the contractual wages negotiated nationally as binding actual wages. We further exclude banks and insurance companies because these do not report data on profitability and revenues that are consistent with those of other private sector firms.

(Table 1 about here)

Table 1 presents some information on bargaining coverage and the presence of a wage cushion in the private sector. It can be seen that in 2023 about one-fifth of plants are covered by a multi-employer or single-employer collective agreement.[7] Almost 37

[7] Since larger plants are more likely to be covered by collective agreements, bargaining coverage of employees is much higher and amounted to about 37 percent in our sample (using weighted data). For

percent of these plants do not deviate from the contractual wages stipulated in these agreements whereas about 63 percent of plants report to pay wages above the level of contractual wages. Table 1 also shows that there are substantial differences between western and eastern Germany. Whereas in western Germany about 22 percent of private sector plants are covered by a collective agreement, this only applies to 14 percent of plants in eastern Germany. In addition, the percentage of plants that pay wages above the level stipulated in the collectively agreement is lower in eastern Germany. These differences in wage setting and the different economic and labour market situation in both parts of Germany (see, e.g., Schnabel, 2016) suggest that eastern and western Germany should be analyzed separately in the empirical investigation.

(Table 2 about here)

Table 2 contrast the presence of a wage cushion at the beginning and end of our observation period. It can be seen that wage cushions have become more prevalent over time in both parts of the country. In western Germany, the share of plants covered by a collective agreement that pay wages above the level stipulated in this agreement has risen from 49 percent in 2008 to 64 percent in 2023. In eastern Germany, this increase has even been more pronounced (from 27 to 58 percent). These increases should be seen against the background of substantially falling bargaining coverage in this period (see Hohendanner and Kohaut, 2024; Schnabel, 2025). If it is mainly plants that are financially constrained that leave collective bargaining, the remaining plants under collective bargaining are more likely to be those who are better off and can afford to pay wage premia.[8]

Table 2 also indicates that in small plants with less than ten employees, actual wages do exceed contractual wages less often than in larger plants. In 2023, the relationship between plant size and the incidence of a wage cushion looks hump-shaped both in western and eastern Germany in that wage cushions are most likely to be found in the group of plants with 10 to 49 employees. In 2008, however, a (slightly different) hump-shape only shows up in eastern Germany, whereas the relationship appears to

detailed analyses of bargaining coverage in the private and public sector and its development over time, see Hohendanner and Kohaut (2024) and Schnabel (2025).

[8] Although hard empirical evidence on which factors make plants leave collective bargaining is sparse, it has been found that plants which pay effective wages above the contractual wage or that operate a profit-sharing scheme are less likely to retreat from collective bargaining (see Kohaut and Schnabel, 2003a; Addison et al., 2013).

monotonic in western Germany. Of course, it needs a multivariate analysis to clearly identify the relationship between plant size and the wage cushion.[9]

(Table 3 about here)

Table 3 reports the size of the wage cushion and the proportion of affected employees in 2016, the last year for which this information is available. It shows that in those plants that pay wages above the contractual wage, the wage cushion (calculated as the amount by which actual wages exceeded contractual wages) was about 12 percent on average.[10] The size of the wage cushion does not differ much between western and eastern Germany and it does not show a clear relationship with plant size.

Table 3 also makes clear that in plants with a wage cushion, not all employees enjoy higher wages. The proportion of employees who get paid above the contractual wage is about 70 percent in western and 65 percent in eastern Germany. In both parts of the country, the proportion of affected employees falls with the size of the plant.

4. Empirical analysis

In contrast to Cardoso and Portugal (2005) and Card and Cardoso (2022), who analyze both the contractual wage and the wage cushion, we lack data on contractual wages in the plants that are our units of observation. This means that we are only able to investigate the presence and size of a wage cushion in Germany and the proportion of affected employees as reported by plant management.[11] The IAB Establishment Panel data used include information on a large number of potential plant-level covariates and are supplemented by data on the regional unemployment rate at the level of districts.

Summary statistics of the dependent and explanatory variables employed are reported in Appendix Table 1. Note that most explanatory variables that are available in our data set (and partly have been used in previous empirical analyses) are consistent with more

[9] The incidence of the wage cushion also varies between sectors. It is relatively high in the restaurants, hotels and food sector, in financial services in western Germany and in the construction industry in eastern Germany whereas it is quite low in the primary sector (agriculture, forestry and energy) in both parts of the country.

[10] This finding implies that among all plants covered by a collective agreement (including those not paying above the contractual wage) actual wages exceeded contractual wages by about 6 percent.

[11] Due to the lack of data on the contractual wages of individuals or plants, most studies for Germany analyze actual wages. A typical finding is that actual wages are several percent higher in plants covered by collective agreements, although this may partly reflect a non-random selection of firms and employees into collective bargaining regimes (see, e.g., Addison et al., 2014; Bonaccolto-Töpfer and Schnabel, 2023; Guertzgen, 2009; Hirsch and Mueller, 2020). However, in these studies it cannot be distinguished whether higher actual wages are due to higher contractual wages or to a higher wage cushion at the plant level.

than one of the five theoretical approaches sketched above, so that the importance of some variables in a specific theoretical approach does not automatically provide valid exclusion restrictions (Jung and Schnabel, 2011). This means that there are few clear-cut hypotheses which could be used to empirically test the relevance of these theories, and we will not try to do so. Nevertheless, following Jung and Schnabel (2011), we may use economic theory as a guide in selecting explanatory variables in our following empirical analysis.

In three of the five theoretical explanations discussed in Section 2, the state of the labour market is a major determinant of the wage cushion. We include the regional unemployment rate (at the district level) and the plants' vacancies for basic and skilled jobs as explanatory variables. Higher regional unemployment rates and lower vacancy rates are expected to be associated with a lower incidence and size of the wage cushion. In order to reduce potential problems of reverse causality, these three explanatory variables are lagged by one year in our estimations.

We also control for the composition of the workforce by including the employment shares of skilled workers, part-time workers and women as explanatory variables. Since quits of skilled workers would be particularly costly to the firm, we expect that this group of workers is more likely (and to a larger extent) to be paid above the contractual wage. In contrast, the lower labour force attachment and tenure of female and part-time workers suggest that these groups will rarely be paid wages above the contractual level. This reasoning is consistent both with efficiency wage and bargaining explanations of the wage cushion.

Bargaining theory, rent-sharing explanations and the fair-wage variant of efficiency wage theory all suggest that the existence and size of the wage cushion is positively associated with the profitability of a plant. Therefore, we include a dummy variable indicating whether managers regarded the plant's profit situation in the previous year as very good or good. A similar dummy variable reflects a modern production technology in the plant, which we expect to correlate positively with the wage cushion. State-of-the-art technology may indicate the presence of quasi-rents and favour rent-sharing, but it could also mean that plants have to attract and motivate high-skilled workers by paying wage premiums. In addition, the presence of rents to be shared is crudely reflected by a plant's revenue per worker, which should be positively related to the existence and size of a wage cushion.

As the extent to which firms are willing to share rents may depend on their ownership and management, we include two further dummy variables that indicate whether a plant

is partly or exclusively managed by the owner(s). We expect that owner-managed plants are less likely to voluntarily pay higher wages than stipulated in the collective agreements since they regard such a rent-sharing as a redistribution at the expense of owners' residual profits.

According to bargaining explanations of the wage cushion, workforce-elected works councils, which have substantial bargaining power in many areas according to the Works Constitution Act, can be expected to make managers or owners pay wages above the contractual level. A similar reasoning applies to alternative forms of worker representation set up by management (like round tables), although these forms do not have statutory rights and are less powerful. Thus, we include two dummy variables reflecting the existence or not of a works council and of an alternative form of employee representation in the plant. The works council variable (and consequently also the alternative representation variable) is lagged by one year to avoid endogeneity problems that could result if employees chose to erect a works council in order to obtain a higher wage cushion.[12]

In the institutional approach discussed in Section 2, the presence of a wage cushion reflects the fact that (in contrast to firm-level agreements) collective agreements at sectoral level cannot take into account the specific situation of individual plants. We thus include a dummy variable for the existence of a firm-level rather than a sectoral-level collective agreement. As such an agreement actually can take into account the firm-specific situation, the wage cushion should be considerably lower (or even non-existent) in plants that have such firm-level agreements. The regression coefficient of this dummy variable is expected to be negative.

Efficiency wage theory implies that the wage cushion should be positively correlated with the size of a plant. Whereas supervising and monitoring employees is relatively easy in small plants, larger plants exhibit more complex organizational structures and more difficulties in workforce supervision, so that it may be sensible for them to pay wage premiums as incentives. We include four plant size dummy variables in our estimations, which allows for a non-linear relationship.

Finally, in our estimations we control for sector affiliation (by including eight industry dummies) and for the type and size of municipalities (ten dummies).

[12] Empirical evidence by Jirjahn (2009) and Oberfichtner (2019) suggests that employees primarily introduce works councils not to engage in rent-seeking activities but rather to protect their existing quasi-rents, so that the works council variable should not create an endogeneity problem in our analysis.

Tables 4 and 5 report the results (marginal effects) of our empirical investigations using data from the IAB Establishment Panel for the year 2016, the last year where data on the size of the wage cushion are available. Due to the different labour market situation and the substantial differences in bargaining coverage and the presence of a wage cushion discussed above, we present separate estimations for western Germany (Table 4) and eastern Germany (Table 5). The dependent variable in our estimations is the size of the wage cushion in percent. This size cannot become negative and often is zero as a large share of plants covered by collective agreements do not pay higher actual than contractual wages (see Table 1). Therefore, we use the tobit estimation procedure which explicitly takes account of the qualitative difference between zero observations (i.e. no wage cushion) and continuous observations (i.e. the size of the wage cushion in percent). An implicit restriction of the tobit model is that the covariates play a similar role in both explaining the presence and the size of the wage cushion. This can be tested by estimating a probit model (for the presence of a wage cushion) and a truncated regression model (for the size of the wage cushion, taking account of the censoring at zero) and performing a likelihood ratio test against the more restrictive tobit model. By running separate probit and truncated regression models we shall also see whether the presence or the size of the wage cushion is better explained by our covariates.[13]

(Table 4 about here)

Starting with the results for western Germany in Table 4, the tobit estimation in the first column shows that not all covariates play a statistically significant role in explaining the wage cushion. We find that the wage cushion is lower when the regional unemployment rate is higher and it is higher if a plant has vacancies, the majority of which refers to skilled jobs. The wage cushion is positively related to the profitability of the plant whereas it is lower in plants covered by firm-level agreements. Although the existence of a works council is not significantly related to the size of the wage cushion, alternative forms of employee representation in the company are. As expected, the wage cushion is related to establishment size. Similar to the descriptive results from Table 2, small plants with fewer than ten employees are less likely to pay wages above the contractual level (but the relationship with establishment size is not monotonous).

While the tobit estimation procedure applied in the first column of Table 4 combines information on the presence and size of the wage cushion, the next two columns present a probit model for the presence of the wage cushion and a truncated regression model

[13] For details on the tobit (or censored regression) model and the variants discussed above, see Greene (2018: ch. 19.3).

(taking account of the censoring at zero) for the size of the wage cushion in those plants that pay wages above the contractual level. It becomes obvious that our model is mainly able to explain the presence of a wage cushion whereas the truncated regression model on the size of this cushion has very limited explanatory power, with profitability being the only variable that is weakly statistically significant (at the ten percent level).[14] In the probit model for the presence of a wage cushion, the same variables as in the tobit model discussed above are statistically significant.

(Table 5 about here)

Turning to eastern Germany, the tobit estimations in the first column of Table 5 indicate that fewer explanatory variables than in western Germany play a role for the wage cushion in eastern Germany. Statistically significant coefficients show up for plant size, coverage by firm-level agreements and the existence of vacancies in the plant. Like in western Germany, the truncated regression in the last column has limited explanatory power whereas in the probit model more explanatory variables prove to be statistically significant.

As the results from Tables 4 and 5 clearly show that that our model is not able to explain the size of the wage cushion and as information on this variable is not available after 2016, we now focus on the presence of a wage cushion. For this variable, we have information covering the entire observation period from 2008 to 2023. Table 6 (for western Germany) and Table 7 (for eastern Germany) report the results of probit estimations pooled for the entire observation period and of cross-sectional analyses for the years 2008 and 2023.

(Table 6 about here)

The pooled probit estimations in the first column of Table 6 show that in western Germany most of our explanatory variables are statistically significantly related to the presence of a wage cushion (at the five or one percent level of significance), and usually they have the expected sign of coefficients. We see that a wage cushion is less likely the higher the regional unemployment rate is and it is more likely if the company has vacancies to fill (both for basic and skilled jobs). The presence of a wage cushion is positively related to the plant's share of skilled workers whereas other indicators of workforce composition seem to play a minor role. It is also positively related to the profitability, the revenue per employee and the state of production technology of the

[14] This low explanatory power of the truncated regression confirms an insight by Jung and Schnabel (2011) for the year 2006. Note that the tobit model's implicit restriction that the covariates play a similar role in both explaining the presence and the size of the wage cushion is rejected in a likelihood ratio test.

plant. For example, the probability of paying wages above the level stipulated in the collective agreement is about 3 percentage points higher in plants with a good or very good profit situation. Somewhat surprising, the existence of a works council is negatively related to the wage cushion whereas the association with alternative forms of employee representation is positive. In contrast to our expectations, plants that are partly or exclusively managed by their owners are more likely to have a wage cushion. As expected, the probability of having a wage cushion is clearly lower in plants covered by firm-level agreements (by almost 15 percentage points) and in small establishments.

By and large, these findings from the pooled estimations are confirmed when looking at the first and last year of our observation period (in columns 2 and 3 of Table 6), although these two cross-sections are based on a substantially lower number of observations and thus typically show a reduced level of statistical significance. Somewhat surprising, we find that the profitability of the plant loses statistical significance over time.[15]

(Table 7 about here)

Table 7 reports the estimation results for eastern Germany. Similar to western Germany, the pooled probit in the first column indicates that vacancies, the share of employees with skilled jobs, profitability, establishment size and the coverage by a firm-level agreement are all statistically significantly related to the presence of a wage cushion. In contrast, the regional unemployment rate and the revenue per employee do not play a statistically significant role in eastern Germany. Although the variables indicating the existence of a works council and of alternative forms of employee representation are statistically significant (with opposite signs) in the pooled estimation, they become insignificant in the two cross-sections for 2008 and 2023. Looking at these two cross-sectional estimations in columns 2 and 3, we again see that the profit variable becomes insignificant over time (like in western Germany).[16] As in western Germany, plants that are partly or exclusively managed by the owners are more likely to have a wage cushion, but only at the end of the observation period.

Although not many explanatory variables are consistently significant in each pooled or cross-sectional estimation both for western and eastern Germany, the results in Tables 4 to 7 make clear that there is a core of variables associated with the existence of wage cushions which are of main theoretical and empirical interest. When attempting to

[15] Conducting separate cross-section estimations for each single year (available on request) shows that the coefficient of the profit variable is statistically insignificant from 2022 onwards in western Germany whereas the revenue per employee variable retains its statistical significance.

[16] Note that establishment profitability decreased in the 2020s, but this decrease was not accompanied by a reduction in the prevalence of wage cushions.

interpret these empirical findings in terms of the five theoretical approaches discussed in Section 2, we are aware that the wage cushion cannot be explained by one theoretical approach only, and we find at least partial support for each of these five explanations. Starting with the market approach, the statistical significance of vacancies and of the regional unemployment rate (in western Germany) is consistent with this approach, but of course also with other theories. Some of the covariates suggested by bargaining theories such as profits, unemployment and worker representation prove to be statistically significant (even if the negative relationship with works council existence is unexpected). The wage cushion's association with unemployment, plant size and the profitability of a plant is consistent with efficiency wage considerations. Concerning theories of rent sharing, the finding that the probability of having a wage cushion rises with profitability, modern production technology and revenue per employee (the latter two variables only in western Germany) supports this approach.[17] Finally, we can confirm the institutional hypothesis as plants that make use of firm-level collective agreements which enable them to take firm-specific conditions explicitly into consideration are significantly less likely to have wage cushions.

The last step in our empirical analysis is exploiting the panel character of our data and conducting fixed effects estimations for the observation period 2008 to 2023, although this reduces the sample size by more than 90 percent. We apply fixed effect logit analyses of the presence of a wage cushion, the results of which are presented in Table 8 for western and eastern Germany.[18]

(Table 8 about here)

In these fixed effects estimations, not all explanatory variables retain their statistical significance, which may partly be due to the smaller sample size and the fact that some variables such as owner-management and production technology do not vary much over time. In western Germany, a wage cushion is more likely to exist (at the ten percent level of significance) if the profit situation of the plant is very good or good and if revenues per employee are higher, which is consistent with bargaining, rent sharing and efficiency wage explanations. The probability of a wage cushion also increases with the share of skilled employees whereas it decreases with the share of female employees. A wage cushion is less likely if the plant is covered by a firm-level agreement, which is

[17] A new and somewhat surprising result is that plants fully or partly managed by owners are more likely to pay higher wages and thus practice rent sharing. This finding needs further investigation, for instance by conducting personal interviews with owners.

[18] In contrast to previous tables, Table 8 presents estimated coefficients rather than marginal effects since our fixed effect logit estimations do not allow calculating marginal effects in a similar way.

consistent with the institutional approach. Interestingly, when including highly significant year dummies as crude indicators of the overall business cycle, the regional unemployment rate is insignificant. This finding (also reported by Jung and Schnabel, 2011) suggests that it is the cyclical rather than the regional component of the unemployment rate that plays a role. Put differently, the wage cushion seems to vary more with the business cycle than with conditions on the regional labour market.

In eastern Germany, our model is statistically significant as a whole, but almost all covariates are insignificant individually at conventional levels. Notable exceptions are some plant size dummies and the year dummies which underscore the descriptive finding in Table 2 that the probability of a wage cushion has increased over time.[19]

The fact that in Table 8 (as well as in Tables 5 and 7) our empirical model performs much worse in eastern than western Germany may partly reflect the fact that the number of plants and observations is substantially lower in the eastern German samples. In addition, it may indicate that at the low level of bargaining coverage in eastern Germany, paying wages above the level stipulated in the collective contract is more idiosyncratic. Put differently, as many other studies show (see the review by Schnabel, 2016), even more than 20 years after German unification, the characteristics and results of labour markets in eastern and western Germany still differ in many respects, including wage setting.

Note that our main insights do not substantially change when we perform some robustness checks (results are available on request). For instance, we removed the revenue per worker variable, which is theoretically and empirically important but characterized by many missings. This removal increased our sample size by up to 31 percent in some specifications but did not affect our major results.

Finally, we briefly analyzed whether the wage cushion was affected by the introduction of a statutory national minimum wage in Germany in 2015. Although this introduction reduced wage inequality (Bossler and Schank, 2023), plants covered by a collective bargaining agreement were much less likely affected by the minimum wage, and bargaining coverage did not change significantly (Bellmann et al., 2021). Nevertheless, when including a shift dummy for the existence of the minimum wage that takes the value of 1 from 2015 onwards, we found that the probability of the existence of a wage cushion increased by 8 percentage points among all companies in eastern Germany

[19] For both western and eastern Germany we also find an association between owner-management and the presence of a wage cushion, but somewhat surprisingly this association is only statistically significant for establishments that are partly managed by the owners (and insignificant for plants exclusively managed by the owners).

(and 9 percentage points among those companies that had workers below the new minimum wage). However, no change is seen in western Germany (results are available on request). This finding is consistent with the strong rise in the presence of wage cushions in eastern Germany reported in Table 2. It probably reflects that in eastern Germany the introduction of the minimum wage meant that the affected low-skilled workers now received a higher wage which was similar to what better-qualified workers had earned before. In order to maintain a pay differential between low- and better-qualified workers, some companies may have started to pay higher wages for the latter group, which resulted in a wage cushion. A similar effect did not occur in western Germany where wages are generally higher and the bite of the minimum wage is substantially lower.

5. Concluding remarks

Based on representative data from the IAB Establishment Panel, this study has shown that in 2023 about 63 percent of those plants in Germany which were covered by collective agreements paid wages above the level stipulated in these agreements. This resulted in a wage cushion of about 12 percent between the levels of actual and contractual wages in these plants (in 2016). The shares of plants with a wage cushion are higher in western than eastern Germany and have risen over time in both parts of the country, with a considerably stronger increase in eastern Germany. Cross-sectional and fixed-effects analyses for the period 2008 to 2023 indicate that in western Germany the presence of a wage cushion is mainly related to plant profitability and revenue, to plant size, to unemployment and vacancies and to the business cycle. In addition, we find that plants which apply collective agreements at the firm level rather than the sectoral level are less likely to have wage cushions since these firm-level agreements make it easier to explicitly take firm-specific conditions into account in wage setting. In eastern Germany, however, fewer of these explanatory variables prove to be statistically significant (which may partly be due to a smaller sample size). Our empirical results are consistent with various theoretical explanations, ranging from bargaining and rent-sharing approaches over efficiency wage considerations to market-related and institutional explanations of the wage cushion. They indicate that both internal factors of a plant (like profitability and revenue) and external factors (like unemployment and the business cycle) are relevant for wage setting at the plant level.

Although most of our econometric results are consistent with those of a previous empirical analysis for Germany with data until 2006 by Jung and Schnabel (2011), we

cover a much longer and more recent observation period and also provide some new insights. For example, we find that the probability of a wage cushion is positively related to plants' revenue per employee (in western Germany). Together with the statistical significance of plant profitability, this finding can be interpreted as support for the rent-sharing explanation which was not discussed in older analyses. Against our expectations, we find that plants which are partly or exclusively managed by the owner(s) tend to be more likely to pay wages above the contractual level, and we do not obtain a clear picture on the role that the existence of various forms of employee representation play in establishing wage cushions.

We also show that wage cushions have become more prevalent in the last 16 years, both in eastern and western Germany.[20] The fact that bargaining coverage has fallen drastically in the last decades in Germany while at the same time the prevalence of wage cushions has increased, can be interpreted in various ways. On the one hand, it may simply reflect that mainly those plants which are financially constrained quit collective bargaining, so that the plants remaining under collective bargaining are those which are better off and can afford to pay wages above the level stipulated in collective agreements. On the other hand, both the reduction of coverage by binding collective agreements and the higher prevalence of wage cushions can be interpreted as signs that the traditionally rigid German system of wage determination has become more flexible and differentiated. The existence of wage cushions as well as their responsiveness to the business cycle and to plant profits is particularly important in allowing wages to differ between more and less profitable firms, in such a way overcoming a fundamental problem of sectoral bargaining (see also Card and Cardoso, 2022). Wage cushions also give plants some room for manoeuvre in adjusting actual wages more quickly to changing economic conditions than is possible in the (usually annual) bargaining rounds that determine contractual wages. Given that the German system of rather centralized wage determination is under threat from various sides (Jäger et al., 2022; Schnabel, 2025), it remains to be seen whether such an increased flexibility is sufficient to stabilize the system or whether a more fundamental decentralisation of the entire system is required.

[20] This finding stands in contrast to the decreasing relevance of the wage cushion in Spain (see Dominguez and Rodríguez Gutiérrez, 2016).

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Table 1: Bargaining coverage and presence of a wage cushion in the private sector, 2023

	western Germany	eastern Germany	total
number of plants surveyed	6,161	5,281	11,442
share of plants covered by a collective agreement (in percent)	21.7	13.7	20.1
- percentage of which pay wages as stipulated in the collective agreement	35.9	41.7	36.7
- percentage of which pay wages above the level stipulated in the collective agreement	64.1	58.3	63.4

Notes: Weighted data, private sector only, excluding banks and insurance companies.
Source: IAB Establishment Panel, wave 2023.

Table 2: Presence of a wage cushion according to plant size, 2008 and 2023

	share of plants covered by a collective agreement that pay wages above the level stipulated in the collective agreement (in percent)			
	2008		2023	
number of employees (on June 30)	western Germany	eastern Germany	western Germany	eastern Germany
1 to 9	41.7	22.8	54.5	52.6
10 to 49	58.4	30.2	76.9	67.8
50 to199	65.8	50.1	70.7	61.2
200 and more	66.6	29.9	60.3	57.6
total	48.7	26.6	64.1	58.3

Notes: Weighted data, private sector only, excluding banks and insurance companies.
Source: IAB Establishment Panel, waves 2008 and 2023.

Table 3: Size of the wage cushion and proportion of affected employees according to plant size, 2016

	size of wage cushion (amount by which actual wages lie above contractual wages, in percent)			proportion of affected employees (in percent)		
number of employees (on June 30, 2016)	western Germany	eastern Germany	total	western Germany	eastern Germany	total
1 to 9	11.8	12.4	11.9	77.8	76.5	77.7
10 to 49	11.4	12.9	11.6	67.9	57.4	67.0
50 to199	10.1	9.9	10.1	53.4	47,2	52.7
200 and more	11.9	11.9	11.9	49.1	39.2	48.0
total	11.5	12.3	11.6	70.3	65.3	69.8

Notes: Weighted data, private sector only, excluding banks and insurance companies.
Source: IAB Establishment Panel, wave 2016.

Table 4: Determinants of the wage cushion in western Germany, 2016

Explanatory variables	Tobit estimation (size of wage cushion)	Probit estimation (presence of wage cushion)	Truncated regression (size of wage cushion if present)
Regional unemployment rate#	-0.184***	-0.009**	-0.241
(at district level, in percent)	(0.071)	(0.005)	(0.214)
Vacancies#	(reference = no vacancies)		
Majority of vacancies for basic jobs	0.037	0.029	-1.427
	(0.678)	(0.049)	(1.338)
Majority of vacancies for skilled jobs	1.089**	0.096***	-0.912
	(0.502)	(0.030)	(0.948)
Share of employees for skilled jobs	0.014	0.001	0.010
(in percent)	(0.009)	(0.001)	(0.020)
Share of part-time employees	0.002	0.000	-0.013
(in percent)	(0.012)	(0.001)	(0.026)
Share of female employees	-0.002	-0.000	0.005
(in percent)	(0.011)	(0.001)	(0.021)
Profit situation#	1.347***	0.060**	1.683*
(dummy: very good/good = 1)	(0.421)	(0.028)	(0.875)
Modern production technology	0.757*	0.056**	-0.834
(dummy: 1 or 2 on 5-point scale = 1)	(0.448)	(0.028)	(0.868)
Revenue per employee#	0.361	0.030	-0.169
(in Euros)	(0.337)	(0.024)	(0.548)
Works council#	-0.195	0.038	-2.201
(dummy: 1 = yes)	(0.719)	(0.042)	(1.414)
Alternative forms of employee representation#	1.856***	0.135***	0.581
(dummy: 1 = yes)	(0.514)	(0.038)	(0.944)
Management structure (share of plants)	(reference = no owner management)		
Exclusively managed by owners	0.600	0.060	-0.361
	(0.657)	(0.041)	(1.326)
Partly managed by owners	0.861	0.074	-0.093
	(0.723)	(0.046)	(1.542)
Covered by firm-level agreement	-2.016***	-0.169***	0.715
(dummy: 1 = yes)	(0.754)	(0.042)	(1.282)
Establishment size (number of employees)	(reference = 1-9 employees)		
10-49	2.146***	0.164***	-0.939
	(0.637)	(0.040)	(1.133)
50-199	2.213***	0.153***	-0.581
	(0.755)	(0.048)	(1.401)
200 and more	1.699**	0.118**	-0.333
	(0.833)	(0.059)	(1.585)

Industry dummies	yes***	yes***	yes
Municipality type	yes***	yes***	yes***
Number of observations n	1,267	1,292	780
F resp. X^2	6.182***	221.361***	63.579***
Pseudo R^2	0.021	0.096	/

Notes: Unweighted data, only plants in the private sector covered by a collective agreement. Marginal effects, robust standard errors in brackets; */**/*** denote 10/5/1% level of statistical significance; # indicates that the information refers to the previous year.
Source: IAB Establishment Panel, wave 2016.

Table 5: Determinants of the wage cushion in eastern Germany, 2016

Explanatory variables	Tobit estimation (size of wage cushion)	Probit estimation (presence of wage cushion)	Truncated regression (size of wage cushion if present)
Regional unemployment rate#	0.019	-0.008	1.112
(at district level, in percent)	(0.202)	(0.012)	(0.935)
Vacancies#	(reference = no vacancies)		
Majority of vacancies for basic jobs	-1.890**	-0.124**	-12.220*
	(0.648)	(0.050)	(7.085)
Majority of vacancies for skilled jobs	1.664**	0.074*	3.580
	(0.776)	(0.043)	(3.367)
Share of employees for skilled jobs	-0.013	0.000	-0.202*
(in percent)	(0.016)	(0.001)	(0.112)
Share of part-time employees	-0.030*	-0.002	-0.094
(in percent)	(0.018)	(0.001)	(0.078)
Share of female employees	0.011	0.001	-0.005
(in percent)	(0.020)	(0.001)	(0.087)
Profit situation#	-0.302	-0.020	-0.449
(dummy: very good/good = 1)	(0.478)	(0.031)	(2.433)
Modern production technology	0.444	0.032	1.441
(dummy: 1 or 2 on 5-point scale = 1)	(0.709)	(0.038)	(3.192)
Revenue per employee#	0.135	-0.035	4.254
(in Euros)	(0.550)	(0.029)	(3.479)
Works council#	-1.505*	-0.100	-2.411
(dummy: 1 = yes)	(0.895)	(0.069)	(3.359)
Alternative forms of employee representation#	0.593	0.179**	-16.363*
(dummy: 1 = yes)	(0.905)	(0.080)	(9.585)
Management structure (share of plants)	(reference = no owner management)		
Exclusively managed by owners	-0.219	-0.042	0.881
	(0.838)	(0.059)	(3.267)
Partly managed by owners	-0.787	-0.023	-4.274
	(0.901)	(0.071)	(4.675)
Covered by firm-level agreement	-1.977**	-0.169***	3.182
(dummy: 1 = yes)	(0.982)	(0.059)	(3.619)
Establishment size (number of employees)	(reference = 1-9 employees)		
10-49	2.672***	0.221***	-0.413
	(0.542)	(0.039)	(2.695)
50-199	3.292***	0.276***	0.449
	(0.851)	(0.062)	(2.667)
200 and more	5.836***	0.377***	6.382
	(1.684)	(0.085)	(6.262)

Industry dummies	yes**	yes*	yes
Municipality type	yes***	yes***	yes
Number of observations n	587	600	247
F resp. X^2	6.492***	224.489***	55.199***
Pseudo R^2	0.040	0.138	/

Notes: Unweighted data, only plants in the private sector covered by a collective agreement. Marginal effects, robust standard errors in brackets; */**/*** denote 10/5/1% level of statistical significance; # indicates that the information refers to the previous year.
Source: IAB Establishment Panel, wave 2016.

Table 6: Probit estimations for the presence of a wage cushion in western Germany, 2008-2023

Explanatory variables	Pooled: 2008-2023	2008	2023
Regional unemployment rate#	-0.009***	-0.007	-0.009
(at district level, in percent)	(0.003)	(0.006)	(0.006)
Vacancies#	(reference = no vacancies)		
Majority of vacancies for basic jobs	0.042***	0.071*	0.055
	(0.014)	(0.038)	(0.055)
Majority of vacancies for skilled jobs	0.063***	0.077**	0.074*
	(0.011)	(0.035)	(0.043)
Share of employees for skilled jobs	0.001***	0.001*	-0.000
(in percent)	(0.000)	(0.000)	(0.001)
Share of part-time employees	-0.000	-0.001	-0.002**
(in percent)	(0.000)	(0.001)	(0.001)
Share of female employees	-0.000	-0.001	0.001
(in percent)	(0.000)	(0.001)	(0.001)
Profit situation#	0.030***	0.059***	-0.023
(dummy: very good/good = 1)	(0.010)	(0.023)	(0.031)
Modern production technology	0.069***	0.076***	0.071**
(dummy: 1 or 2 on 5-point scale = 1)	(0.011)	(0.022)	(0.035)
Revenue per employee#	0.052***	0.044**	0.056**
(in Euros)	(0.008)	(0.017)	(0.026)
Works council#	-0.070***	-0.107***	-0.143***
(dummy: 1 = yes)	(0.020)	(0.036)	(0.054)
Alternative forms of employee representation#	0.061***	0.055	0.154***
(dummy: 1 = yes)	(0.014)	(0.042)	(0.057)
Management structure (share of plants)	(reference = no owner management)		
Exclusively managed by owners	0.040**	0.054*	0.107**
	(0.017)	(0.031)	(0.054)
Partly managed by owners	0.051**	0.027	0.124**
	(0.021)	(0.042)	(0.059)
Covered by firm-level agreement	-0.147***	-0.212***	-0.114*
(dummy: 1 = yes)	(0.019)	(0.040)	(0.063)
Establishment size (number of employees)	(reference = 1-9 employees)		
10-49	0.139***	0.106***	0.122***
	(0.017)	(0.033)	(0.043)
50-199	0.183***	0.159***	0.105*
	(0.022)	(0.044)	(0.055)
200 and more	0.164***	0.173***	0.151**
	(0.025)	(0.050)	(0.062)
Industry dummies	yes***	yes***	yes**
Municipality type	yes***	yes***	yes

Number of observations n	19,659	1,766	794
X^2	652.555***	268.925***	145.138***
Pseudo R^2	0.064	0.092	0.100

Notes: Unweighted data, only plants in the private sector covered by a collective agreement. Marginal effects, robust standard errors in brackets; */**/*** denote 10/5/1% level of statistical significance; # indicates that the information refers to the previous year.
Source: IAB Establishment Panel, waves 2008-2023.

Table 7: Probit estimations for the presence of a wage cushion in eastern Germany, 2008-2023

Explanatory variables	Pooled: 2008-2023	2008	2023
Regional unemployment rate#	-0.006	-0.003	-0.015
(at district level, in percent)	(0.004)	(0.006)	(0.014)
Vacancies#	(reference = no vacancies)		
Majority of vacancies for basic jobs	0.038*	0.080	0.123*
	(0.022)	(0.056)	(0.067)
Majority of vacancies for skilled jobs	0.063***	0.131***	0.121**
	(0.017)	(0.046)	(0.047)
Share of employees for skilled jobs	0.001**	0.001	0.001
(in percent)	(0.000)	(0.001)	(0.001)
Share of part-time employees	-0.002***	-0.000	0.001
(in percent)	(0.000)	(0.001)	(0.001)
Share of female employees	0.000	0.000	-0.003*
(in percent)	(0.000)	(0.001)	(0.001)
Profit situation#	0.028**	0.092***	0.052
(dummy: very good/good = 1)	(0.014)	(0.032)	(0.047)
Modern production technology	0.026*	0.043	0.089*
(dummy: 1 or 2 on 5-point scale = 1)	(0.016)	(0.034)	(0.048)
Revenue per employee#	0.012	-0.016	-0.013
(in Euros)	(0.012)	(0.017)	(0.032)
Works council#	-0.122***	-0.065	-0.042
(dummy: 1 = yes)	(0.030)	(0.045)	(0.062)
Alternative forms of employee representation#	0.060**	0.018	-0.003
(dummy: 1 = yes)	(0.026)	(0.085)	(0.089)
Management structure (share of plants)	(reference = no owner management)		
Exclusively managed by owners	-0.026	0.002	0.150**
	(0.025)	(0.038)	(0.063)
Partly managed by owners	0.038	-0.062	0.203**
	(0.031)	(0.050)	(0.088)
Covered by firm-level agreement	-0.182***	-0.125**	-0.185***
(dummy: 1 = yes)	(0.024)	(0.049)	(0.061)
Establishment size (number of employees)	(reference = 1-9 employees)		
10-49	0.150***	0.042	0.146***
	(0.022)	(0.041)	(0.055)
50-199	0.205***	0.144***	0.117
	(0.028)	(0.053)	(0.074)
200 and more	0.193***	0.034	-0.048
	(0.037)	(0.062)	(0.139)
Industry dummies	yes**	yes	yes
Municipality type	yes***	yes*	yes
Number of observations n	8,766	767	441

X^2	471.375***	154.818***	110.055***
Pseudo R^2	0.100	0.090	0.111

Notes: Unweighted data, only plants in the private sector covered by a collective agreement. Marginal effects, robust standard errors in brackets; */**/*** denote 10/5/1% level of statistical significance; # indicates that the information refers to the previous year.
Source: IAB Establishment Panel, waves 2008-2023.

Table 8: Fixed-effects logit estimations of the presence of a wage cushion, 2008-2023

Explanatory variables	Western Germany	Eastern Germany
Regional unemployment rate#	-0.085	0.055
(at district level, in percent)	(0.063)	(0.058)
Vacancies#	(reference = no vacancies)	
Majority of vacancies for basic jobs	-0.062	-0.027
	(0.098)	(0.152)
Majority of vacancies for skilled jobs	-0.019	-0.119
	(0.076)	(0.106)
Share of employees for skilled jobs	0.003*	-0.001
(in percent)	(0.002)	(0.003)
Share of part-time employees	0.001	-0.000
(in percent)	(0.003)	(0.004)
Share of female employees	-0.008**	0.004
(in percent)	(0.003)	(0.006)
Profit situation#	0.110*	0.133
(dummy: very good/good = 1)	(0.065)	(0.096)
Modern production technology	0.042	0.086
(dummy: 1 or 2 on 5-point scale = 1)	(0.073)	(0.108)
Revenue per employee#	0.191*	-0.197
(in Euros)	(0.105)	(0.144)
Works council#	-0.031	0.178
(dummy: 1 = yes)	(0.235)	(0.385)
Alternative forms of employee representation#	0.009	-0.126
(dummy: 1 = yes)	(0.097)	(0.198)
Management structure (share of plants)	(reference = no owner management)	
Exclusively managed by owners	-0.088	0.107
	(0.174)	(0.230)
Partly managed by owners	0.344**	0.536**
	(0.171)	(0.246)
Covered by firm-level agreement	-0.465***	0.111
(dummy: 1 = yes)	(0.178)	(0.256)
Establishment size (number of employees)	(reference = 1-9 employees)	
10-49	0.280	0.450
	(0.191)	(0.299)
50-199	0.821***	1.020**
	(0.289)	(0.403)
200 and more	1.531***	1.161**
	(0.402)	(0.561)
Year dummies	yes***	yes***
Municipality type	yes	yes**
Number of observations n	8,552	3,916
Number of plants n	1,430	632

X^2	130.115***	146.073***
Pseudo R^2	0.020	0.048

Notes: Unweighted data, only plants in the private sector covered by a collective agreement. Robust standard errors in brackets; */**/*** denote 10/5/1% level of statistical significance; # indicates that the information refers to the previous year.
Source: IAB Establishment Panel, waves 2008-2023.

Appendix Table: Summary statistics of the sample (2023)

variables	western Germany		eastern Germany	
	mean	std. dev.	mean	std. dev.
presence of a wage cushion *(dummy: actual wages above contractual wages = 1)*	0.6450	0.4787	0.5642	0.4962
regional unemployment rate *(at district level, in percent)*	5.6749	2.5326	6.7706	1.5810
vacancy rate *(in percent of employment)*	5.6052	10.0965	6.6325	11.3449
vacancies for skilled jobs *(share of all vacancies, in percent)*	33.9986	42.7017	37.8146	45.4177
share of employees for skilled jobs *(in percent)*	70.8686	27.6226	78.4078	26.4543
share of part-time employees *(in percent)*	25.0865	26.6196	19.7642	24.5291
share of female employees *(in percent)*	36.7587	30.8866	32.6916	30.3929
profit situation *(dummy: very good/good = 1)*	0.4618	0.4987	0.5283	0.4995
modern production technology *(dummy: 1 or 2 on 5-point scale = 1)*	0.5978	0.4905	0.5819	0.4935
revenue per employee *(in Euros)*	168890.2	251812.0	170637.0	364368.3
works council *(dummy: 1 = yes)*	0.2758	0.4471	0.2289	0.4204
alternative forms of employee representation *(dummy: 1 = yes)*	0.1243	0.3300	0.0891	0.2850
management structure (share of plants)				
no owner management	0.2376	0.4257	0.2604	0.4391
exclusively managed by owners	0.6459	0.4784	0.6385	0.4807
partly managed by owners)	0.1166	0.3210	0.1011	0.3016
covered by firm-level agreement *(dummy: 1 = yes)*	0.1096	0.3133	0.1825	0.3865
establishment size *(number of employees)*	124.7601	468.5495	71.0237	461.5085

Notes: Unweighted data, only plants in the private sector covered by a collective agreement, excluding banks and insurance companies.
Source: IAB Establishment Panel, wave 2023.

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