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## ABSTRACT

### **Minimum Wages as a Barrier to Entry: Evidence from Germany\***

This study analyses employers' support for the introduction of industry-specific minimum wages as a cost-raising strategy in order to deter market entry. Using a unique data set consisting of 800 firms in the German service sector, we find some evidence that high-productivity employers support minimum wages. We further show that minimum wage support is higher in industries and regions with low barriers to entry. This is particularly the case in East Germany, where the perceived threat of low-wage competition from Central and Eastern European Countries is relatively high. In addition, firms paying collectively agreed wages are more strongly in favour of minimum wages if union coverage is low and the mark-up of union wage rates is high.

JEL Classification: J38, J50, L41, L80

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# 1 Introduction

The economic effects of minimum wages on employment have been a very active field of research for at least the last two decades, from both a theoretical and an empirical perspective (see Neumark and Wascher, 2008, for an overview). Other important economic consequences of minimum wages, however, have been rather neglected. This is particularly the case for the possibility that minimum wages might be used to influence the degree of competition on the product market, which has been shown to have played a role in both the U.S. and Germany (cf. Williamson, 1968; Heitzler and Wey, 2010). In particular, firms may be able to increase their profits by improving their competitive position through a minimum wage, thus effectively forming a cartel.

The possibility of raising rivals' costs through minimum wages critically hinges upon the condition that all firms can be forced to pay the higher, entry-preventing wage. In this regard, the German labour market offers an interesting opportunity to directly study the link between minimum wages and product market competition, because minimum wages in Germany are introduced at the industry level at the initiative of employers and trade unions by declaring collective bargaining agreements as generally binding. This way of introducing minimum wages also exists in a number of other industrialized countries such as France, the Netherlands and Portugal. The results of our study are thus of general interest for the analysis of cost-raising strategies to influence the degree of competition in an industry.

To the best of our knowledge, this is the first empirical analysis of employers' attitude towards the introduction of minimum wages. We use a unique data set covering 800 firms from eight different service sectors in Germany, where a minimum wage introduction was being discussed at the time of the survey. Our analysis explores the determinants of supporting or opposing the introduction of a minimum wage paying particular attention to the role of product market competition. Furthermore, we scrutinize the institutional features of the labour market that are associated with firms' support of minimum wages.

The results of our analysis have several important implications. First, a cartel in favour of minimum wages may not only reduce the number of firms operating in the market, but also the number of employees. This can be seen as an alternative mechanism through which minimum wages are potentially harmful to employment. Second, the monopolistic rents achieved on the product market by the surviving firms are paid by the consumers, which potentially reduces social welfare. Third, our results also apply to many other countries with

similar institutional features. The incentive of firms' and workers' associations in the more prosperous countries of the European Union to collude in order to introduce minimum wages may increase further as migration from poorer (mainly Eastern European) EU Member States becomes more important. Firms' support of minimum wages can thus be viewed as a showcase example for how social policies in Western Europe may act as protectionist instruments against competition from low-wage countries.

The remainder of this paper is structured as follows. Section 2 briefly reviews the institutional background with respect to minimum wages in Germany. We present the relevant economic theory in Section 3. The empirical strategy and the data are described in Section 4. The empirical results are presented in section 5. The final section summarizes and concludes the discussion.

## 2 Institutional Background

Germany is one of the few European countries without statutory minimum wages. This has remained broadly unquestioned for several decades, because high coverage rates of collective bargaining provided an effective floor for wages. However, since the beginning of the 1990s, union density as well as coverage have been decreasing continuously (Kohaut and Ellguth, 2008). This development coincided with an increase in wage inequality, especially at the bottom of the wage distribution (Dustmann, Ludsteck, and Schönberg, 2009), although it is not clear whether the decline in collective bargaining has been a causal factor in this context (Antonczyk, Fitzenberger, and Sommerfeld, 2010).

At the same time, the completion of the EU's Single Market progressed in terms of both increased intra-EU trade and labour mobility. This led to a rise in the number of posted, low-wage workers in the German construction industry during the 1990s, which was perceived as a threat to the employment prospects of German workers and eventually led to the introduction of minimum wages in this industry in 1997. Thus, the main motive for the introduction of minimum wages in this sector was protectionist, i.e. the aim was to shield the German construction industry from low-wage competition (Woolfson and Sommers, 2006).

The issue of increased competition in the service sector gained further importance in 2006 when the European Union passed the Service Directive, also referred to as 'Bolkestein Directive', which aimed at enhancing the free movement of services already agreed upon in

the Treaty of Rome as one of the four freedoms of the EU's Single Market (Menz, 2010). The Service Directive intends to lower the regulatory barriers between countries which prevent the provision of services in another EU Member State. Indeed, Kox and Lejour (2006) argue that policy heterogeneity is the main obstacle to intra-EU trade in services and to the possibility to open an establishment in another EU country.

Next to the actual increase in competition caused by the Service Directive, the intense public discussion of the directive's first draft may have influenced the perception of low-wage, competitive threats from the new Member States. The Service Directive's first draft intended to apply the 'country of origin principle (COP)' to the temporary provision of services abroad, which specifies that workers in the host country are subject to the laws and regulations of the home country. This applies to social policy and labour market regulation, including collectively bargained wage rates and minimum wages. Saint-Paul (2007) argues that the COP makes personal services tradable in the sense that the service can be bought in any EU Member State and the travelling cost for the worker performing the service constitutes a special type of transportation cost.

The COP has been heavily criticized in high-wage countries such as Germany by both employer associations and trade unions, as it was perceived as a threat to employment, wages and working conditions of German workers. As a consequence, the social partners as well as the German government have agreed upon extending minimum wages beyond the main construction industry (Menz, 2010).

The legal background for any minimum wage in Germany, the Posting of Workers Law, constitutes the national implementation of an EU directive which provides the framework for the temporary exchange of labour between EU Member States. The contribution of this law is twofold. First, it allows the extension of collective agreements to all firms and workers in an industry, independently of their membership in an employer association or a trade union. Such an extension amounts effectively to the introduction of a collectively bargained minimum wage at the industry level. Second, the Posting of Workers Law stipulates that minimum working standards, including minimum wages, must apply to domestic and foreign workers alike.

Note that extensions of collective agreements, partly in addition to minimum wages, are not uncommon in the European Union. According to Kerckhofs (2011) such extensions are frequently used in Belgium, the Czech Republic, Finland, France, the Netherlands, and

Portugal, although the exact mechanisms differ. In Spain, collectively agreed wage rates automatically apply to all workers in an industry by law. Therefore, our analysis does not only apply to Germany, but to all countries with a tradition in the extension of collective agreements.

Another important aspect of the Posting of Workers Law in Germany is that it specifies strict requirements for a collective agreement to be declared generally binding. First, the initial collective agreement must be representative, implying that no additional collective agreement exists in the respective industry that covers more workers or union members. Second, the extension of the collective agreement should be in the public interest. Third, the social partners need to apply jointly for an extension, which requires a high degree of consensus. If these conditions are met, the Federal Ministry of Labour and Social Affairs usually declares the collective agreement generally binding without consulting any additional governmental bodies or institutions. Only when the application is filed for the first time, a committee consisting of three representatives of the respective trade union and employer association has to give its consent.

The Posting of Workers Law was adopted in 1996 and applied for the first time in 1997 in the German construction industry. Even though additional industries have been included since then, minimum wages up to now do not exist in the majority of sectors.<sup>1</sup> However, against the background of the decline in union density and coverage, the increase in wage inequality, and the introduction of the Service Directive, the political pressure to extend minimum wage legislation has grown further during the last few years. Given that minimum wages in Germany are introduced at the industry level, it is conceivable that they may be used as an instrument to influence the degree of competition in an industry.

### 3 Theoretical Considerations

Traditional labour market theory, such as the Marshallian or the monopsonistic models of the labour market, does not offer an explanation for the observation that some firms are in favour of minimum wages. By contrast, the industrial organization literature explicitly models the link between unionization and cost raising strategies in order to deter entry and/or push

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<sup>1</sup>In December 2011, minimum wages existed for the waste disposal industry, main construction, mining, roofers, electricians, commercial cleaning, painters and varnishers, elderly care, security services, as well as laundry services.

existing competitors out of the market. From this point of view, minimum wages increase competitors' labour costs, which may explain employers' support for minimum wages.

The idea that cost-raising strategies can be used to decrease competition on the product market originates from the industrial organization literature (Salop and Scheffman, 1983, 1987). There, the focus is on activities by individual firms such as inducing suppliers to discriminate against competitors, controlling exclusive distribution channels, lobbying for product standards or government regulation, as well as advertising and R&D races. However, cost-raising strategies can also become effective through the labour market.

The first type of model in this vein is based on the insider-outsider theory in terms of wage setting (Gollier, 1991, Ishiguro and Zhao, 2009). If outsiders, i.e. unemployed workers, are not unionized, they can be hired at a lower cost compared to insiders. This will stimulate low-cost firms to enter the market. Incumbent employers may therefore be interested in raising the wages of outsiders, thereby increasing product prices and restricting industry output. Insiders are also motivated to increase wages of outsiders in order to secure themselves against becoming unemployed. Furthermore, the increased price on the product market legitimates insiders' wage premium. Thus, (unionized) insiders and employers form a coalition to increase wages for outsiders. This behaviour discourages market entry of new firms. Chappell, Kimenyi, and Mayer (1992) deliver one of the few empirical studies on this topic. Using US data they show that a higher degree of unionization in an industry is indeed associated with entry deterrence.

Another cost-raising strategy that uses a labour market mechanism consists in minimum wage legislation. In the U.S., this was made clear by the Supreme Court decision "United Mine Workers vs. Pennington", in which the court ruled that the trade union had violated antitrust laws when agreeing with one employer on relatively high wages that were binding for the entire industry (Williamson, 1968). In Williamson's model, the large-scale, capital-intensive firm is more productive than the small-scale, labour-intensive firm. The former can therefore afford to pay wages in excess of the competitive rate, which pushes small-scale firms out of the market. This has important effects for productivity, product variety and prices, as can be inferred from the model by Braun (2011), who analyses the consequences of sector-level bargaining – which effectively amounts to a minimum wage – within the context of the heterogeneous firm model by Melitz and Ottaviano (2008).

In Germany, the notion that high-productivity firms may use minimum wages to improve



their competitive position has been distinctly demonstrated when minimum wages were introduced in the postal sector in 2008. After liberalization of the postal service industry, the former state monopolist ‘Deutsche Post’ strongly supported the introduction of minimum wages. Due to its large-scale logistic infrastructure and the high market share, Deutsche Post could afford to pay considerably higher wages compared to new entrants. Heitzler and Wey (2010) provide an extensive overview of the institutional background and develop a specific model tailored to the Deutsche Post case.

Trade unions and employers are only likely to collude in order to raise wages if certain conditions are met. In the model by Haucap, Pauly, and Wey (2001), trade unions have the option to maximize members’ wage revenue by discriminating wages between firms according to productivity. Whether wage discrimination is superior from the union’s perspective compared to a single entry-preventing minimum wage depends on two factors. Unions will prefer minimum wages over wage discrimination as long as the difference between the union and the competitive wage rate is large, and if a considerable proportion of workers is not unionized.

Independently of the exact mechanism that is used to increase labour costs, the existing theoretical models share two assumptions which are crucial for our empirical analysis. First, the union wage or the minimum wage must apply to all firms and workers alike. This implies either that unionization is in practice mandatory or that union wage rates are extended to the entire industry. Second, the good should not be tradable and no close substitutes should exist, because these models require firms to be able to pass on increasing labour costs to consumers through higher prices. Both conditions are fulfilled for the industries that we investigate in our analysis. First, the Posting of Workers Law ensures that union wage rates can be declared collectively binding. Second, the industries analysed belong to the personal service sector (e.g. hairdressers, florists, motor mechanics, restaurants), which means that the services cannot be imported from abroad but have to be delivered domestically.

Foreign competition in these sectors arises nevertheless if foreign workers are able to supply their labour in Germany, which has become a more important phenomenon with the European Union’s Service Directive (cf. Section 2). Therefore, minimum wages cannot only be used as a barrier to entry towards domestic competitors, but also against low-wage competition from the new Member States.

A survey of German firms, which focuses on the perception of the Service Directive,

confirms the impression that some firms support minimum wages in order to avoid low-wage competition from the new Member States (Kießl, Pohl, and Schmalholz, 2006; Nerb, 2006). Furthermore, industries with skill-intensive production technologies are likely to benefit from trade liberalization through the Service Directive, while the opposite is true for industries with a high share of low-skilled workers (Nerb, 2006). Security services, retailing, and restaurants are specifically named as low-skilled industries, in which competition is expected to increase significantly.

The threat from foreign competition is likely to be perceived as being stronger in regions close to Germany's Eastern border, because competition in the sectors considered in this paper generally takes place at a regional level. To take an example, a Polish hairdresser is much more likely to offer his services close to the Polish border than further away from it. This is in line with results from the survey of firms mentioned above, which shows that firms in East Germany are considerably more likely to perceive the Bolkestein Directive as a threat, and not as an opportunity, compared to firms in West Germany (Kießl, Pohl, and Schmalholz, 2006). Consequently, the threat of low-wage competition should be especially large in those industries that are characterized by low existing barriers to entry, either because of low capital-intensity or few regulatory requirements. Both requirements are met by the industries covered in this study, such as personal services (e.g. hairdressers) or retailing (e.g. florists).

Finally, Williamson (1968) developed his model with the mining sector or more generally manufacturing in mind and equates productivity with firm size and age. By contrast, our empirical analysis deals with the service sector, for which no explicitly positive correlation exists between productivity and firm size (Oi and Idson, 1999; Brown and Medoff, 2003; Bayard and Troske, 1999). In addition, the models based on the insider-outsider theory do not assume that productivity differences between incumbents and entrants exist necessarily. Hence, the relationship between labour productivity, measured e.g. by firm size and age, and the likelihood to support a minimum wage is not clear-cut from a theoretical perspective.

## 4 Data and Empirical Strategy

The data used in this study come from a survey of firms in eight industries in Germany which were likely candidates for the introduction of a minimum wage at the time of the sur-

vey.<sup>2</sup> These industries belong to trade or services and include hardware stores (representing wholesale trade), men’s outfitters and florists (both retailing), motor mechanics (repairs), restaurants (the hotel and restaurant industry), hairdressers (personal services), security firms (business services), and plumbing (construction). Note that production in these sectors is relatively labour-intensive and non-tradable, which is a fundamental condition for a cost-raising strategy to be effective. Among other things, the survey includes questions concerning the attitude of the managers of the firms towards minimum wages, the level of labour productivity, and the institutional background in terms of coverage and degree of collective bargaining.

Managers were asked whether they think that a minimum wage of 7.50 Euros is too low, appropriate or too high. This amount has often been proposed in the public debate on statutory minimum wages in Germany. Managers who answer that the amount is too low are classified as being in favour of a minimum wage introduction, while the opposite is true for managers who think that the amount is too high. In order to take into account the categorical nature of the dependent variable, we estimate an ordered logit model using maximum likelihood. The basic model specification takes the following form:

$$\begin{aligned}
 P(MW = j|\mathbf{x}_{ik}) &= G(\beta_0 + \mathbf{x}_{ik}\boldsymbol{\beta}) \\
 &= G(\beta_0 + \beta_1 PMC_{ik} + \beta_2 East_{ik} + \beta_3 PMC_{ik} * East_{ik} \\
 &\quad + \beta_4 S_{ik} + \beta_5 UL_{ik} + \beta_6 CB_{ik})
 \end{aligned}$$

MW represents the attitude of firm  $i$  in industry  $k$  towards the minimum wage, with  $MW = 0$  indicating that the firm disapproves an introduction and  $MW = 2$  showing that the firm supports an introduction. As a measure for product market competition ( $PMC$ ), either the normalized Hirschman-Herfindahl Index (HHI) or the share of new firms is added to the model. All specifications are estimated with both competition measures, because the motivation for including each of them differs.

The HHI is calculated as the sum of squared market shares, which are defined in terms of turnover. It can take values between  $1/n$  and 1, where  $n$  is the number of firms oper-

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<sup>2</sup>The data were collected by means of telephone interviews. The response rate amounted to 39 percent and was achieved by contacting individual firms up to eight times. A total of 800 interviews were completed within six weeks in February and March 2008. In order to ensure a sufficient number of observations for each industry/region combination, observations from specific industries as well as from East Germany were oversampled. See <http://fdz.rwi-essen.de/> for a description of the data set.

ating in a market. Increasing values of the HHI imply higher market concentration, and a value of one represents a perfect monopoly with one firm holding a market share of 100 percent (Rosenbluth, 1955). Alternatively, the share of new firms is included in the model as a measure for existing barriers to entry. More specifically, a higher share of new firms indicates lower barriers to entry. Both indicators, the HHI and the share of new firms are calculated separately for each included sector at the level of districts (*Kreise*). This regional disaggregation is important because competition only takes place at the regional level in the industries considered in the following analysis.<sup>3</sup>

The correlation between the HHI and the support of a minimum wage is not clear *ex ante*. On the one hand, the collusion of the social partners may be facilitated if the existing degree of competition is rather low. In that case, the HHI should have a positive impact on the likelihood to support a minimum wage introduction. On the other hand, the correlation may be negative. This could be due to the fact that a low level of product market competition and a high degree of union power often occur simultaneously (Stewart, 1990).<sup>4</sup> However, in the presence of strong unions, i.e. a small non-union sector, there is no need to collude in order to establish an additional barrier to entry. In this case, lower competition on the product market may be negatively correlated with minimum wage support. Therefore, the correlation between the HHI and the probability to support a minimum wage cannot be determined theoretically and boils down to an empirical question.

If the increased pressure from the New Member States shapes the attitude towards minimum wages, employers in industries with lower barriers to entry will be in favour of a minimum wage. Thus, a higher share of new firms is expected to be positively correlated with a firm's likelihood to support a minimum wage introduction. Additionally, an interaction term of the share of new firms with the dummy for East Germany (*East*) is included, because the correlation between barriers to entry and being in favour of a minimum wage is expected to be stronger in regions closer to the New Member States. This is especially true because in the selected industrial branches competition takes place at a regional level.

The basic specification additionally includes a dummy for small firms<sup>5</sup>,  $S_{ik}$ , and the share

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<sup>3</sup>The HHI as well as the number of new and existing firms are calculated and provided by the German Federal Statistical Office based on an official statistic on value-added taxes (*Umsatzsteuerstatistik*).

<sup>4</sup>This relation is confirmed in the data by the highly negative and significant correlation between the HHI and the industry union differential, see below.

<sup>5</sup>The indicator for small firms is a dummy that takes the value one if a company's annual turnover does

of unskilled labour,  $UL_{ik}$ , as measures for labour productivity.<sup>6</sup> The effect of the share of unskilled workers on the individual firm's attitude towards the minimum wage is expected to be negative for two reasons. First, the lower human capital endowment of unskilled workers decreases their labour productivity. In addition, firms with a higher proportion of skilled employees might be inclined to be in favour of a minimum wage, because a minimum wage typically increases the wages of unskilled workers more than those of skilled workers. Last but not least, the basic specification includes a dummy  $CB_{ik}$ , which indicates whether the firm pays wages according to collectively agreed rates. Because minimum wages in Germany are set in line with collective bargaining, firms already paying collectively agreed rates should be more inclined to be in favour of a minimum wage introduction as their labour costs would not be affected.

Two extended models are estimated in addition to the basic specification. First, a measure for the size of the non-union sector, the 'industry union differential' (IUD) is added. The IUD is the product of the 'union mark-up' (relative deviation of union wages to free market wages) and the 'non-coverage rate' (share of workers not covered by a collective agreement) and thus provides an overall measure of the potential impact of a minimum wage introduction in a specific industry.<sup>7</sup> In particular, it quantifies the magnitude of the effect of a potential minimum wage introduction by taking into account both, how many people would be affected and how significant the average wage increase would be. Note that the IUD is computed at the industry level and is therefore only characterized by variation between industries.

The IUD itself is expected to have a negative effect on the attitude towards minimum wages, because it is a measure of the bite a minimum wage would have in a specific industry. In contrast, firms with unionised workers should be increasingly interested in a minimum wage, the larger the non-union sector is. Therefore, an interaction term between the non-union sector and the dummy 'collective bargaining' is included. The effect of this interaction term on the dependent variable is expected to be positive.

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not exceed one million Euros (Institut für Mittelstandsforschung Bonn, 2002).

<sup>6</sup>As a robustness test, we also included a dummy for young firms and the indicator for relative productivity as described in Appendix B as productivity measures. However, no significant relation between these measures and the likelihood to support a minimum wage could be established.

<sup>7</sup>Refer to Appendix B for a complete description of the construction of the union mark-up and the non-coverage rate.

Second, instead of the IUD the average wage differential, i.e. the difference between the firm wage and the average industry wage in percent, is included as a control at the firm level. This indicator is meant to capture the bite of a possible minimum wage in an industry.

## 5 Results

The first important result from the survey is that the majority of firms state that a minimum wage of 7.50 Euros would be appropriate (Table 1). In plumbing, retailing, and motor mechanics, firms state more often that a minimum wage of 7.50 Euros is too low. The opposite is true for hairdressing, security services, florists, and restaurants. On average, the support for a minimum wage is much stronger in West compared to East Germany, which is in all likelihood due to the higher wage levels in West Germany.

Competition, as measured by the HHI, is especially high for restaurants and plumbing, and relatively low for wholesale and security services (see Table 2). While a theoretical connection exists between low barriers to entry, implying a high share of new firms, and a high existing degree of competition, measured by a low HHI, no significant correlation exists between the two indicators. In addition, Table 3 shows that it is difficult to establish a relation between the degree of competition and the attitude towards minimum wages without controlling for composition effects. In some industries, minimum wage supporters face a more competitive environment, while the opposite is true in other sectors.

Table 3 suggests that minimum wage supporters are on average smaller than opponents. One possible explanation is that for the chosen industries, firm size in terms of annual turnover is not a direct measure of productivity. Unskilled labour is clearly more common in some industries than in others (Table 2). The share of unskilled labour is negligibly low in traditional craft occupations, such as hairdressers (3 percent) and plumbing (4 percent), and relatively common in security services (35 percent) as well as the restaurant industry (38 percent) (Table 2). Especially in industries the latter industries relying heavily on unskilled labour, minimum wage opponents are generally characterized by an even higher proportion of unskilled labour compared to minimum wage supporters (Table 3). Throughout all industries, firms paying collectively agreed wages are more likely to support a minimum wage introduction. The average wage differential confirms this result: Minimum wage opponents generally pay wages below and supporters above the industry's average (Table 3).

Tables 4 and 5 show the estimation results from the ordered logit models discussed in Section 4 including the HHI and the share of new firms as a measure of competition, respectively. As a robustness test, the specifications were also estimated as logit models, where minimum wage support was defined as stating that a minimum wage of 7.50 Euros would be appropriate or too low, and as linear probability models using OLS. The results are very similar compared to those reported in Tables 4 and 5.

It becomes apparent that the HHI exhibits a significantly negative correlation, indicated by a coefficient value below one, with the support of a minimum wage in West Germany, while the opposite is the case in East Germany (Table 4). This implies that stronger competition on the product market is associated with stronger support of the minimum wage in West Germany, and with lower support of the minimum wage in East Germany. Two observations are worth noting in this context.

First, the statistical significance of the HHI coefficient drops from the 1 percent level in Model 1 to the 10 percent level in Model 2, which differs insofar as the industry union differential (IUD) is included. As discussed in Section 4, this may be interpreted as evidence that the negative correlation between the HHI and the probability to support minimum wages in West Germany can be attributed to a simultaneous occurrence of low product and labour market competition. Thus, as soon as a measure for labour market competition is introduced, namely the industry union differential, the relationship between the HHI as a measure for product market competition and the likelihood to support a minimum wage drops in economic and statistical significance.

Second, the significance of the HHI disappears completely as soon as the average wage differential is added. Hence, the correlation between the HHI and the likelihood of individual firms to support minimum wages is generally not very robust. Therefore, the existing degree of product market competition does not seem to play an important role for minimum wage support, at least for the selected industries, which are characterized by many small firms and a comparably high degree of product market competition.

While the existing degree of product market competition does not seem to play an important role, the notion that firms increase barriers to entry to foreign firms receives stronger support by the estimation results. As discussed in Section 3, it is likely that many firms in the sample fear an increase in competition because of the eastward enlargement of the European Union. In this context, a minimum wage would constitute a very effective barrier

to entry. However, minimum wages are a relatively blunt instrument to reduce competition, and, given that they potentially increase wages, may have major other consequences. Therefore, they are only likely to be used if other barriers to entry in the industry (e.g. entry regulations such as the requirement of mandatory educational standards) are low.

These barriers to entry are proxied by the share of new firms in an industry and region. For West Germany, the effect is insignificant in all specifications (Table 5). In East Germany, by contrast, the effect is as expected as soon as the average wage differential is included as a control variable: A high share of new firms, implying low barriers to entry, is positively correlated with employers supporting minimum wages. This relationship is more important in East Germany, because in comparison to West Germany the threat of foreign competition is more credible.

Firms paying wages according to or in excess of the collectively bargained rate are in general about twice as likely to support the minimum wage (Table 4). The economic and statistical significance is lower in the specification including the share of new firms instead of the HHI. In contrast, the average wage differential is only positively significant in specifications including the share of new firms (Table 5). The positive link between the average wage differential as well as the dummy for collective bargaining and the probability to support a minimum wage is likely to be due to the same effect: Firms not covered by collective bargaining agreements are likely to pay lower wages and therefore oppose minimum wages. For firms that are covered, the opposite is the case.

No significant relationship can be established between the size of the non-union sector, measured by the industry union differential (IUD), and the probability of individual firms to support minimum wages. However, in the specifications including the share of new firms as an indicator for product market competition, the interaction between the IUD and the dummy for collective bargaining is positive and significant at the 5 percent level (Table 5). The coefficient suggests that those firms already paying wages according to or in excess of collective bargaining are more likely to support a minimum wage introduction with an increasing size of the non-union sector. This result is in line with the theoretical model proposed by Haucap, Pauly, and Wey (2001), where a larger non-union sector makes collusion about minimum wages more attractive to unions and employers.

Finally, two indicators which are generally associated with labour productivity, firm size and the share of unskilled workers in a firm's labour force, are analysed. The coefficient of the



dummy variable for small firms is positively significant in the majority of specifications, i.e. small firms are around 50 percent more likely to be in favour of a minimum wage compared to large firms, all else equal. This result is in contrast to the theoretical predictions by Williamson (1968) for the manufacturing sector. The statistical significance is especially high when the average wage differential is included, independently of the competition measure. This result may be interpreted as an indication that firm size is not a good measure for labour productivity in the selected industries, which belong to the service sector as opposed to manufacturing.

The share of unskilled workers in a firm's labour force, in contrast, is significantly and negatively correlated with being in favour of a minimum wage in most specifications. On the one hand, this could be explained by the fact that a higher share of unskilled labour implies lower labour productivity. This interpretation is consistent with higher-productivity firms being in favour of minimum wages, as the latter can improve their competitive position. On the other hand, the "bite" of the minimum wage would be relatively high in a firm with many unskilled workers. Therefore, the introduction of a minimum wage would have a strong impact for these firms, either through an increased wage bill or through the need to reorganise the workforce, which would in all likelihood imply laying off workers and thus a reduction in output and profits.

## 6 Conclusion

This paper analyses the determinants of employers' attitude towards minimum wages using a unique data set on 800 firms in eight service sector industries in Germany. An important finding of this survey is that a majority of firms in these industries supports the introduction of minimum wages. The main question of the paper is whether this finding can be explained by the fact that employers try to use minimum wages in order to raise barriers to entry and reduce the competitive pressure in their industry, both from domestic competitors and from abroad. We find weak evidence that higher competition, as measured by the Hirschman-Herfindahl-Index, is associated with stronger support for minimum wages by firms in West Germany, and a lower support of minimum wages in East Germany.

If measured by the share of new firms in an industry and region, we find evidence that in East Germany, the level of competition is inversely related to the support of minimum

wages. This can be explained by the fact that a high share of new firms indicates low barriers to entry, which makes incumbent firms vulnerable to new competitors. Given the proximity of East Germany to the low-wage countries of Eastern Europe, the (perceived) threat of competition from abroad seems to be the main driving factor here.

Our analysis also investigates the role of institutional features for the support of minimum wages. The estimation results clearly show that firms paying according to collective agreements and operating in industries with a large non-union sector are in favour of a minimum wage. This observation supports the theoretical model by Haucap, Pauly, and Wey (2001) and implies that these employers try to use the minimum wage to increase the labour costs of their rivals, thereby increasing their costs.

Our results have several important implications. First, the German case shows that firms' attitude towards minimum wages seems to be influenced by the potential effects of minimum wages on competition. Second, this result implies that minimum wages may have an effect on both labour market outcomes and product markets (especially prices) through the impact of minimum wages on the level of competition in an industry. From an economic policy point of view, this makes minimum wages a subject for anti-trust authorities. Finally, the case of minimum wages in Germany highlights the role social policies may play as protectionist policy instruments in the wealthier EU Member States, especially with regard to the low-wage countries of Eastern Europe.

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## Appendix A Tables

Table 1: Attitude towards a minimum wage (in percent of the number of answers given)

	East Germany				West Germany			
	-	0	+	N	-	0	+	N
Hairdresser	56.00	40.00	4.00	50	15.79	57.89	26.32	57
Retailing	16.67	60.00	23.33	30	5.45	72.73	21.82	55
Security Firms	66.67	28.57	4.76	21	21.54	64.62	13.85	65
Motor Mechanics	17.78	51.11	31.11	45	10.53	36.84	52.63	57
Wholesale	18.18	54.55	27.27	33	28.57	44.90	26.53	49
Florists	53.49	37.21	9.30	43	19.05	61.90	19.05	63
Plumbing	19.51	53.66	26.83	41	7.02	50.88	42.11	57
Restaurants	32.00	62.00	6.00	50	13.33	68.33	18.33	60
Total	33.36	53.09	13.55	313	15.55	58.99	25.46	463
N	108	154	51	313	70	267	126	463

Note: - “Too high”; 0 “Appropriate”; + “Too low”. N = Number of observations.

Source: Own data collection. For a detailed description of the survey, see Section 4.

Table 2: Summary statistics - Overall and by industry

	HHI	Share of new firms	Small	Unskilled Workers	Collective bargaining	Non-coverage rate	Union mark-up
Hairdresser	0.249 (0.046)	0.102 (0.135)	0.838 (0.368)	0.031 (0.097)	0.853 (0.354)	0.081	0.496
Retailing	0.301 (0.150)	0.101 (0.030)	0.799 (0.401)	0.101 (0.234)	0.807 (0.395)	0.068	0.203
Security Service	0.487 (0.160)	0.134 (0.166)	0.660 (0.474)	0.355 (0.418)	0.895 (0.306)	0.006	0.041
Motor Mechanics	0.248 (0.092)	0.098 (0.032)	0.848 (0.359)	0.056 (0.156)	0.762 (0.426)	0.201	0.545
Wholesale	0.416 (0.140)	0.134 (0.091)	0.361 (0.480)	0.126 (0.230)	0.746 (0.435)	0.185	0.187
Florists	0.260 (0.063)	0.121 (0.093)	0.946 (0.226)	0.112 (0.234)	0.752 (0.432)	0.473	0.294
Plumbing	0.242 (0.060)	0.074 (0.070)	0.861 (0.346)	0.048 (0.163)	0.814 (0.389)	0.167	-0.030
Restaurants	0.191 (0.025)	0.153 (0.150)	0.893 (0.309)	0.478 (0.426)	0.629 (0.483)	0.156	0.417
Total	0.288 (0.145)	0.125 (0.120)	0.750 (0.433)	0.234 (0.362)	0.749 (0.434)	0.136 (0.076)	0.286 (0.184)

Note: Standard deviations in parentheses. No separate values for East and West Germany are reported for the non-coverage rate and the union mark-up, because these indicators are constructed at the level of the industry for the entire country. For the same reason, the standard deviation is not reported.

Source: Own data collection, except for HHI and the share of new firms (both German Statistical Office). For a detailed description of the survey, see Section 4.

Table 3: Summary statistics by minimum wage support and industry

	HHI	Share of new firms			Small	Unskilled Workers	Collective bargaining	Average Wage Differential										
	-	0	+	-	0	+	-	0	+									
Hairdresser	0.238	0.248	0.260	17.3	8.5	8.0	68.5	91.1	92.2	2.5	3.0	5.1	73.8	87.0	93.5	-10.7	3.3	12.6
Retailing	0.270	0.327	0.231	9.1	10.2	9.7	73.5	82.8	69.3	34.5	9.9	4.6	57.2	84.7	71.2	-3.5	1.7	-5.9
Security Firms	0.481	0.483	0.510	23.4	9.7	0.0	69.2	66.7	52.8	43.5	37.1	11.3	85.7	88.7	100.0	-7.4	-0.6	15.7
Motor Mechanics	0.230	0.252	0.239	9.9	10.2	9.7	67.6	89.1	84.9	8.7	6.2	4.6	55.0	79.4	77.3	-15.9	-0.3	5.6
Wholesale	0.465	0.385	0.389	10.6	14.2	23.1	21.5	45.6	35.7	23.0	9.5	7.8	59.7	74.7	90.7	1.9	-2.4	2.6
Florists	0.239	0.267	0.271	12.5	11.6	8.8	97.4	92.0	100.0	15.2	8.2	16.0	63.3	77.7	87.1	-9.9	0.1	14.2
Plumbing	0.207	0.245	0.249	7.3	8.1	6.5	95.7	77.8	95.4	0.0	7.3	2.6	70.7	83.9	79.7	6.1	-4.5	5.2
Restaurants	0.198	0.188	0.195	15.4	15.6	15.4	92.9	87.8	90.5	41.3	49.6	55.5	47.4	62.9	79.0	-7.9	0.3	7.2
Total	0.318	0.283	0.268	13.9	12.7	11.6	66.3	77.8	75.6	29.0	26.3	14.4	62.5	75.2	82.4	-5.2	-0.3	5.3

Note: - "Too high"; 0 "Appropriate"; + "Too low". The table reports mean characteristics of minimum wage supporters and opponents. All figures, except for the HHI, are in percent. The non-coverage rate and the union mark-up are omitted from the table because these variables are the same for all firms in an industry.

Source: Own data collection, except for HHI and the share of new firms (both German Statistical Office). For a detailed description of the survey, see Section 4.



Table 4: Estimation results for minimum wage support - HHI

	Model 1	Model 2	Model 3	Model 4
Herfindahl Index (HHI)	0.223*** (0.067)	0.311* (0.171)	0.323* (0.175)	0.236 (0.194)
East Germany	0.261** (0.132)	0.253** (0.133)	0.266** (0.139)	0.406 (0.294)
HHI*East	9.083* (9.716)	10.119* (11.214)	9.335* (10.540)	3.818 (5.929)
Small	1.565* (0.367)	1.541* (0.364)	1.537* (0.366)	1.820*** (0.271)
Unskilled labour	0.392*** (0.118)	0.391*** (0.113)	0.390*** (0.112)	0.361*** (0.071)
Collective bargaining	1.916** (0.443)	1.972** (0.480)	1.423 (0.613)	2.637* (1.255)
Industry union differential (IUD)		1.035 (0.045)	0.980 (0.078)	
IUD*Collective bargaining			1.069 (0.060)	
Average wage differential				1.003 (0.002)
F	11.489	11.773	8.535	14.990
Observations	515	515	515	441

Note: Marginal effects on the odds ratio from ordered logit model. Significance: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Standard errors in parentheses. Industry dummies are not included, because they are jointly insignificant.

Source: Own data collection, except for HHI (German Statistical Office). For a detailed description of the survey, see Section

4.

Table 5: Estimation results for minimum wage support - Share of new firms

	Model 1	Model 2	Model 3	Model 4
Share of new firms (SNF)	0.191 (0.243)	0.175 (0.232)	0.208 (0.275)	0.072 (0.109)
East Germany	0.307** (0.137)	0.297** (0.136)	0.320** (0.144)	0.334** (0.147)
SNF*East Germany	8.854 (12.308)	9.371 (13.437)	7.781 (11.160)	28.372* (47.284)
Small	1.859* (0.654)	1.792 (0.635)	1.771 (0.640)	2.110*** (0.439)
Unskilled labour	0.498** (0.146)	0.489** (0.129)	0.487** (0.126)	0.422*** (0.088)
Collective bargaining	1.545 (0.390)	1.584* (0.403)	0.895 (0.213)	2.185 (1.164)
Industry union differential (IUD)		1.040 (0.046)	0.950 (0.067)	
IUD*Collective bargaining			1.118** (0.047)	
Average wage differential				1.004** (0.002)
F	15.634	31.826	15.075	40.024
Observations	416	416	416	349

Note: Marginal effects on the odds ratio from ordered logit model. Significance: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Standard errors in parentheses. Industry dummies are not included, because they are jointly insignificant.

Source: Own data collection, except for share of new firms (German Statistical Office). For a detailed description of the survey, see Section 4.

## Appendix B Data appendix

### B.1 Construction of variables

The IUD consists of the union mark-up and the non-coverage rate. These indicators are derived from the survey as follows. The union mark-up is defined as the relative deviation of average wages paid by collectively organized employers to average wages paid by firms not covered by any collective agreement. The necessary indicators for wages and collective bargaining are derived from two items in the survey. First, respondents state whether they pay wages according to, in excess of, or below the collectively bargained rate applicable to their industry. This item is used as a proxy for the firm's membership in an employer association. Second, we use the hourly wage of skilled labour with a minimum of three years of work experience. The survey asks specifically for the wage rates of skilled and unskilled labour, with and without work experience. Clearly, in the context of minimum wages, the wage rate for unskilled workers appears to be most relevant. However, the wage rate for skilled labour with work experience is the only one with a sensible number of observations. Assuming that within each firm, wage gaps between different skill groups are proportionally equal in size, it should not matter which wage rate is used.

The non-coverage rate amounts to the ratio of workers not covered by collective agreements to all workers in the industry, and quantifies the difference between the union and the non-union sector in terms of the number of workers.

### B.2 Robustness tests

In the empirical analysis, we included the following additional/alternative variables which did not alter the results significantly and are therefore not included in the final specification:

- An indicator variable for young firms, which is defined as a dummy variable which takes the value one if the firm is younger than or equal to six years. The specific threshold is based upon the work by Garnsey (1998), who shows that 60 percent of all new companies fail within the first six years.
- Annual turnover per employee as a measure of productivity. As annual turnover varies strongly between the different industries, we used its percentage deviation from the industry's mean in order to be able to compare this variable across industries.