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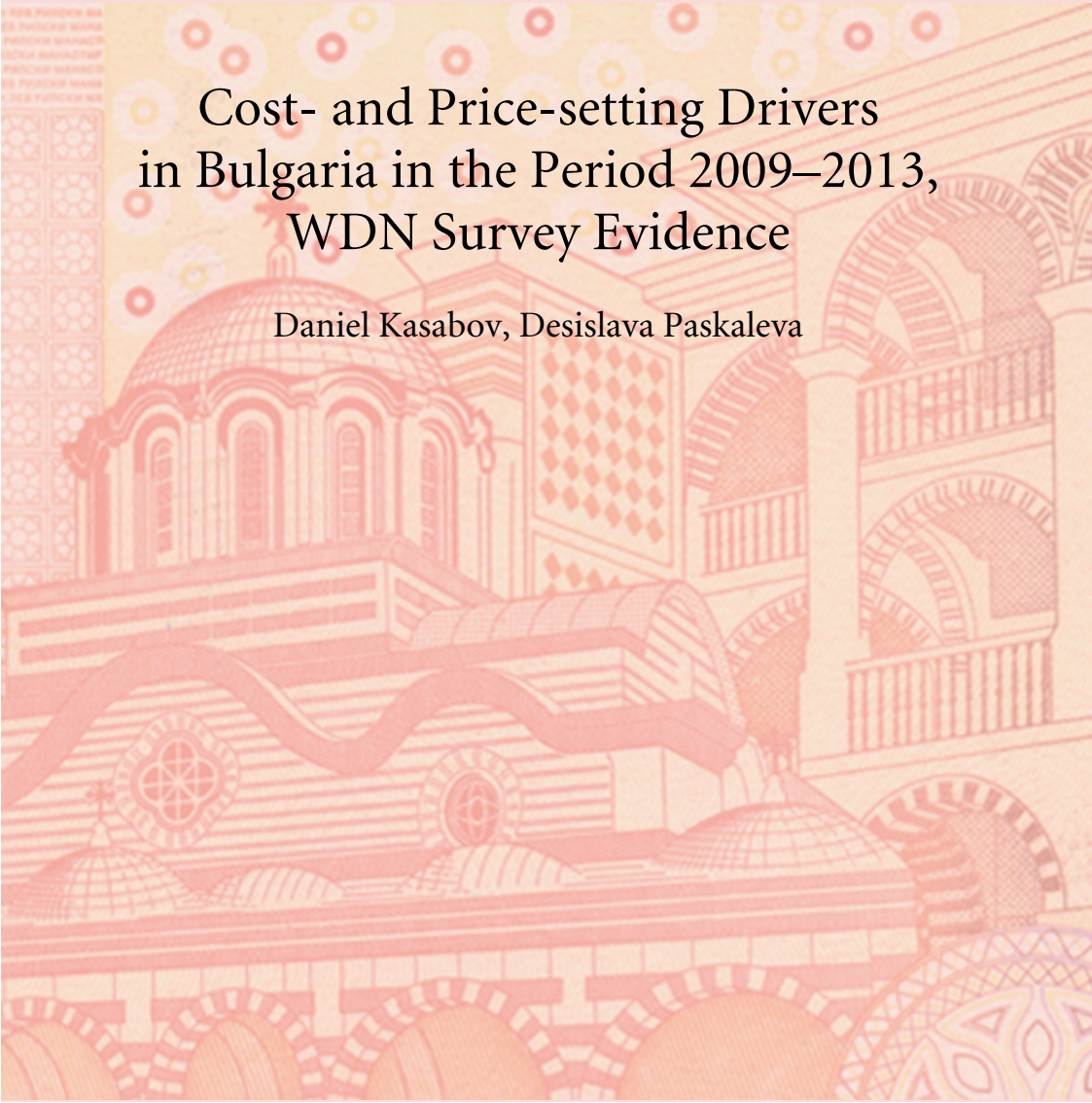
Daniel Kasabov, Desislava Paskaleva



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CONTENTS

Abstract: This paper explores the patterns of price and cost adjustment strategies of Bulgarian firms over the period 2009–2013 based on evidence from firm-level survey data collected within the third wave of the Wage Dynamics Network survey (WDN3). We find that in the explored period firms' price- and cost-setting decisions were mostly the result of changed macroeconomic conditions and the types of shocks that negatively affected firms. Whereas cost changes were more likely related to changes in the access to external financing, costs of supplies, the structure of the wage bill/employment and labour market institutions, price changes depended more on the demand conditions, intermediate input costs and the price-setting behaviour of the main competitors. The survey suggests that the wage-price link is relatively weak with some indications that the link has strengthened recently (compared to the previous WDN2 round) in line with the continuous wage, price and productivity convergence processes

JEL classifications: C25, D22, E23, J31
Keywords: survey data, cost adjustment, price adjustment, wage-price

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1. INTRODUCTION

Understanding firms' adjustment mechanisms of prices and costs, and identifying their drivers is crucial for gaining insights into the economic impact of monetary policy. There is broad consensus that policy decisions have significant real effects, at least in the short run, because nominal prices and/or cost components (including wages) are not completely flexible. Moreover, the degree of pass-through of cost changes to prices affects the competitiveness of the economy. This is particularly relevant for a country such as Bulgaria that experienced oil price shocks and positive ULC growth rates (mainly due to changes in the composition of employment, wage convergence, administrative increases of minimum wage and social security thresholds) in the aftermath of the global financial crisis. Last but not least, micro-founded survey results can help central banks to improve the calibration of the widely used New Keynesian macro models with price and wage stickiness features (Kasabov et al., 2017).

The interplay between costs and prices in particular could run in both directions and could contain important information about the determinants of inflation. Rising wages is a key cause of "cost-push" inflation because labour costs constitute a substantial share of firms' total costs, especially in the services sector (Dunstan et al., 2009). In a "cost-push" inflation environment increases in costs and wages in particular (adjusted for changes in productivity) will help to explain movements in prices as firms look to maintain profit margins. On the other hand, the "demand pull" view of inflation implies that excessive demand pressure will cause firms to raise their prices, prompting workers to demand higher wages. In this case inflation is considered to be driving wage increases.

This paper aims to explore the factors behind the price and cost-setting behaviour of Bulgarian firms in the period 2009–2013 and to examine the cost-price link for different sub-groups of firms. The paper uses data from the third wave of the Wage Dynamics Network (WDN) survey[1], which is a follow-up of a survey that was carried out in Bulgaria in 2009 (WDN2) and which examined firms' behaviour in 2008–2009. The previous survey wave explored responses of prices and cost components to hypothetical shocks (Lozev et al., 2011) and identified a relatively weak wage-price link in Bulgaria compared to other EU countries (Vladova, 2012), which was attributed to the relatively low share of labour costs in firms' total costs at the time of the survey as well as to the strong demand conditions that prevailed prior to the financial crisis. The

[1] The WDN is a research network comprising economists from the European Central Bank (ECB) and the national central banks (NCBs) of the EU countries.

current survey (WDN3) was conducted in the second half of 2014 and focuses on firms' responses to actual as opposed to hypothetical shocks in a post-crisis environment.

The latest survey results presented in this paper indicate that downward price and wage flexibility was maintained in the explored period (2009–2013) with increased incidence of price and wage declines, particularly for firms affected by negative shocks. The flexibility of price and cost changes is further evidenced by their responsiveness to the changes in macroeconomic conditions. Furthermore, WDN3 survey results identify a slight variation in the exogenous factors, which were relevant for price and cost decisions in the period 2009–2013. Whereas the changes in cost components were more likely linked to changes in the access to external financing, costs of supplies, source of revenues, the structure of the wage bill/employment and labour market institutions, price changes were more likely related to the demand conditions and the price-setting rule firms were following.

Furthermore, the paper provides evidence on a relatively weak pass-through of cost increases to prices in the period 2009–2013, particularly for firms hit by negative shocks. This is indicated by the observation that the majority of firms, hit by negative shocks over the survey period reduced their prices, irrespective of their cost setting behaviour. Moreover, the explored cost-push factors (non-demand shocks, including access to external financing, access to usual suppliers and clients' ability to pay shocks, and labour market institutions) are statistically insignificant covariates of price changes for this period within the presented regression results. In terms of the wage-price link, the WDN3 survey continues to suggest that it is relatively weak with some indications that the link has strengthened in the new survey period with the continuous wage, price and productivity convergence processes.

The rest of the paper is structured as follows. The next section provides an overview of the literature exploring the cost- and price-setting behaviour of firms, as well as its determinants. The third section of the paper introduces the survey sample and its composition and presents some relevant firm-level indicators. In section 4 the paper further presents the macroeconomic environment in which firms operated during the period explored in the WDN3 survey and the cost and price reactions of firms according to the macro and micro data survey evidence. The fifth section tries to shed light on the main factors behind price- and cost-setting behaviour in this period, based on available information in the survey. It first presents descriptive evidence on the directly reported drivers of price-setting behaviour and then summarizes the available information on the wage-price link by making an overview of the

directly integrated questions on the wage-price link in the survey, namely the frequency of wage and price changes, the practice of inflation indexation of wage changes, as well as the relevance of labour costs for price changes. The section then explores the covariates of cost and price changes, as well as of the frequency of price and wage changes, and their interconnection within a multivariate regression framework. Finally, section 6 concludes.

2. LITERATURE REVIEW

In order to maintain a certain profitability level, firms rely on several channels of adjustment to changes in the conditions they are operating in. They can be broadly summarized as changing the level of their output, the price of their main product or service and their production costs, including the costs of labour input. If firms are limited in their reactions in respect to these channels, they may have to operate at lower profit levels.

Previous WDN2 results indicate that in 2009 Bulgarian firms were more likely to use the profit margin channel, followed by cost and price adjustments than to reduce output as a reaction to unanticipated demand or cost-push shocks, Lozev et al. (2011). Firms' willingness to give up their profits relative to using other adjustment channels was attributed to their favourable financial position in 2008–2009. In terms of cost components firms indicated a preference for non-labour cost relative to labour cost adjustment strategies as a response to negative shocks. From the labour cost components reductions in temporary employees and flexible wage components were preferred to permanent employment and base wage cuts.

The relative relevance of the price and cost adjustment channels to shocks is found to depend on a number of factors, including institutional, structural features and the extent of price stickiness (see *e.g.* Bertola et al., 2010). In general, product market competition is found to affect mainly price setting, whereas labour market institutions tend to influence wage setting and therefore the relative importance between the employment and wage adjustment channels.

Bertola et al. (2010) examine European firms' WDN2 survey responses to shocks and find that firms exposed to stronger competition or having a higher export share in total sales are less likely to increase prices and more likely to reduce costs after a wage shock.

The presence of collective wage agreements at industry or national level are found to make price increases more likely, whereas firm-level agreements tend to have the opposite effect.

Similarly, the frequency of price changes is found to be higher (Carlton, 1986; Hall, 2000) and price reaction to shocks faster (Alvarez and Hernando, 2007) at more competitive firms. Druant et al. (2009) also find that more frequent price adjustments are associated with higher degree of competition and exposure to foreign markets, as well as with a lower share of labour costs in total costs (consistently, prices are found to be stickier in business services). Conversely, the presence of firm-level collective bargaining agreements facilitates wage flexibility, whereas the stringency of employment protection legislation (EPL) and the coverage of collective agreements act in the opposite direction. The authors also find that larger firms change wages and prices more often. Higher wage flexibility is associated with deregulated and/or decentralized wage bargaining and lower degree of indexation to inflation. Firms that use other means of wage adjustments than base wages, for example bonuses, also seem to adjust base wages more often. Furthermore, the presence of internal policies that index base wages to (past or expected) inflation turns out to be positively correlated with the frequency of wage change, confirming that inflation stands as an important driving force of more frequent wage adjustment.

Labour costs and the workforce composition are found to also affect price and wage flexibility. The higher the fraction of firms' labour costs in total costs as well as the share of highly skilled personnel and of white-collars, the lower the frequency of price changes. Wages are also found to be more rigid for highly skilled/white-collar workers and for those with high tenure and/or a permanent contract (Babecky et al., 2009; Campbell and Kamlani, 1997; Du Caju et al., 2007).

Prices in the manufacturing and market services sectors are adjusted less frequently (Druant et al., 2009). On the other hand, wages turn out to be significantly stickier in the services sub-sectors.

The frequency of wage changes is found to be lower than the frequency of price changes (Druant et al., 2009). The cross-sectoral variation in the frequency of price adjustment is large compared to that of wage adjustment.

Price and cost changes are found to feed into each other (Druant et al., 2009). Economic theory suggests that increases in labour costs in excess of productivity gains should put upward pressure on prices if firms want to maintain a certain profit level, which through real marginal costs is implemented within the Phillips curve of New-Keynesian models. Similarly, price increases are likely to make workers demand higher nominal wages. Therefore, a stronger simultaneity of wage and price setting and higher wage flexibility would increase the pace of nominal adjustment and would result

in shorter and less severe business cycle fluctuations (Olivei and Tenreyro, 2010). Moreover, since labour and product market institutions are important determinants of wage and price flexibility, they are also found to affect the wage-price link (Kandil, 2003).

Labour market developments have been used by central banks to explain why price inflation did not decline by as much as conventional models would have predicted following the 2007-2009 recession (*e.g.* downward nominal wage rigidity, Daly and Hobijn (2014), short-term unemployment rate as a proxy for real activity, Gordon (2013)). However, some studies identify a break in the relationship between labour costs and prices, with changes in labour costs having little or no predictive power for price inflation after the early 1980s (Peneva and Rudd, 2015). This can partially be attributed to the abundant low-wage labour force working for a global market place coupled with rapid productivity growth in emerging economies and lower import prices in the advanced economies, which have reduced price- and wage-setting power in the advanced economies (Holz and Mehrotra, 2013).

Based on the above findings in the literature, the paper explores the following issues and hypotheses:

- To what extent firms' price- and cost-setting behaviour over the period 2009–2013 was affected by firm-level characteristics, workforce characteristics, the macroeconomic environment and institutional factors.
- Lower profit margins in the post-crisis period, as suggested by macro evidence, and the continuing productivity convergence are expected to have contributed to strengthening the relationship between wages and prices.

3. DATA

The paper uses Wage Dynamics Network firm-level survey data for Bulgaria, conducted on behalf of the Bulgarian National Bank in the second half of 2014, and gathers information on firms' price- and cost-setting behaviour over 2009–2013. The dataset comprises 528 enterprises from the manufacturing, construction, trade and other market services sectors (the sample composition is presented in the Appendix) and follows closely the population distribution of firms in the country in terms of sector, firm-size groups and regions. A more thorough presentation of the data and some of the main results from the survey can be found in Paskaleva (2016).

The WDN3 survey gathers information on the direction of changes in prices (on the domestic and foreign markets), costs and various aspects of the

macroeconomic conditions (such as demand, external financing, access to suppliers and clients' ability to pay) in 2009 and for the period 2010–2013 separately[2]. The developments of four main cost components are explored: labour costs, financing costs, costs of supplies and other costs. An interesting feature of the survey is that it additionally gathers evidence on the important exogenous drivers behind each of the cost components, which in this case are different types of exogenous changes in the macroeconomic or institutional conditions. Important exogenous drivers of labour cost changes explored within the WDN3 survey are the various aspects of labour market institutions, such as outside-firm collective agreements, firm-level wage bargaining agreements as well as the share of employees receiving the minimum wage and being insured at the minimum social security threshold. An important exogenous factor behind financing cost changes, explored within the survey is the access to external financing. Costs of supplies can be directly related to the access to usual suppliers within the WDN3 survey. All of the cost and price components can additionally be explored, depending on the demand conditions in which firms operated. This enables us to explore and isolate the role of exogenous sources of change in the respective cost and price components, as opposed to strategic cost and price setting decisions. Additionally, we can explore whether exogenous cost-push factors played a role for price changes, which provides indications for the strength of the cost-price link. Moreover, the survey offers evidence on the main price-setting rules and distinguishes between dependent pricing (*i.e.* the price for the main product is either set by a parent company, or regulated, or determined by the main client), which is followed by around one fourth of the firms in the WDN3 survey sample, and independent pricing strategies[3].

[2] The WDN3 survey answers on the realized direction and magnitude of changes of the respective cost component for the two sub-periods 2009 and 2010–2013 varies from 1 to 5, with 1 indicating strong decrease, 2 being decrease, 3=no change, 4=increase and 5=strong increase.

[3] Survey results allow us to divide firms into two broad groups depending on the degree of their pricing autonomy. The first group consists of firms that do not/cannot follow an independent policy (*i.e.* follow dependent price-setting strategies) – their price for the main product is either set by a parent firm, or regulated, or determined by the main customers. Companies in the second category are those that decide their prices autonomously: they could (i) be price followers of their main competitors, (ii) decide prices according to a mark-up on their costs, (iii) negotiate prices with individual customers.

Following the previously presented arguments, the dataset offers a possibility to investigate both the direction and the frequency of cost and price changes[4] in the period 2009–2013 by various sub-groups of firms and distinguish between the role of exogenous cost- and price-setting institutions and changes in the macroeconomic conditions and firm-level characteristics such as sector, size and labour force composition factors.

A number of competitiveness indicators are also available, such as the reliance of firms on revenues from foreign markets and the role of competitive pressures on price setting. The survey also gathers information on the self-reported reasons behind the price changes. A summary of the explored factors in this paper could be found in Table 8.

4. COST- AND PRICE-SETTING CHARACTERISTICS OVER THE PERIOD 2009–2013

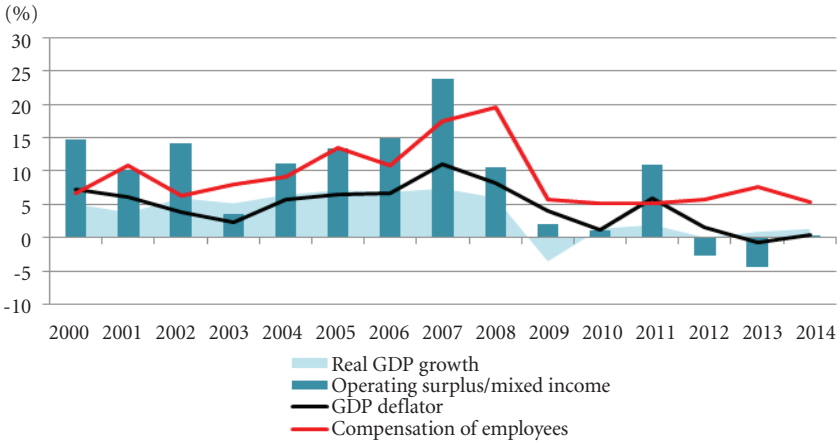
4.1. Macro data evidence

The WDN3 survey was conducted in the second half of 2014, and this period was characterized by low inflation and weak economic growth following the recession in 2009 (see Figure 1). The global economic and financial crisis represented a significant external shock to the domestic economy and was reflected in the reduction of external demand for Bulgarian exports and lower capital inflows. Initially the financial crisis affected negatively the export-orientated manufacturing sector and the shock subsequently propagated to the other sectors of the economy. This triggered increasing economic uncertainty in all sectors of the economy and prompted changes in the behaviour of economic agents compared to the pre-crisis period. Households increased their precautionary savings, resulting in a decline in private consumption in 2009 followed by a prolonged period of weak recovery of household expenditures. Furthermore, economic uncertainty prompted an initial increase in interest rates on new loans and tightening of credit standards by domestic banks. In an

[4] The question on the frequency of price changes for firms' main product distinguishes between the following range of categories: daily, weekly, monthly, quarterly, twice a year, once a year, less frequently than once a year, never for the period 2010–2013. The frequency of wage adjustment was instead tackled through three separate questions capturing different sub-periods: prior to 2009, 2009 and 2010–2013 correspondingly. Respondents could choose from the options: more than once a year; once a year; once in a year and a half; once every two years; less frequently than once every two years; never. In the subsequent analysis of the answers concerning price setting, the first three options are aggregated, on the one hand, and the fourth and fifth, on the other, and end up with four categories: daily to monthly, quarterly to half-yearly, yearly and less frequent than yearly. As for wages, we aggregate the third and fourth categories into a single one, which we label as "less frequently than once a year".

environment of low demand and tightened financing conditions, firms faced the need to optimize their costs and particularly labour costs which are to a large extent under their control.

Figure 1: **Main macroeconomic indicators, National Accounts, annual % change**



Sources: NSI, own calculations.

Initially, firms reacted to the reduced demand in 2009 by contracting their output and by shedding employment. The subsequent recovery of economic activity in 2010–2013 remained "jobless" as firms continued to cut labour costs by reducing the number of employees (employees decreased cumulatively by 8.6% in 2010–2013). At the same time, compensation per employee kept growing, albeit at a slower pace compared with the pre-crisis period. The adopted strategy of firms to cut employment boosted real productivity over 2010–2013 and contributed to lower ULC growth than in the pre-crisis period. Macro data suggests that profits were another channel of adjustment to shocks as firms' profitability (measured by the gross operating surplus) deteriorated in the post 2009 period.

Sector-level data reveals that there was much heterogeneity among firms' reactions to the changed macroeconomic conditions and that changes in economic activity and employment were more aligned than aggregate level dynamics suggest. Furthermore, there is evidence that even though cost adjustment strategies of firms did not entirely coincide with the real GDP drop, they reflected the varying duration and magnitude of the decline in economic activity across different economic sectors (Economic Review 4/2014). What

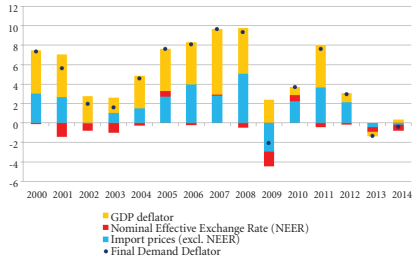
is more, stronger wage growth in sectors with larger gross value added and employment declines also reflected the stronger labour shedding of lower paid workers in these sectors and resulted in compositional shifts in the wage structure of the employees.

During economic downturns prices are one of the key mechanisms underlying firms' adjustment practices. Changes in prices reflect firms' reactions to shocks, labour cost developments as well as the impact of external factors. On a macro level price dynamics could be examined through the decomposition of the final demand deflator. Given the small size and open economy of Bulgaria, available data suggests that external factors exerted downward pressure on prices for most of the 2009–2013 period and were related to the decline in import prices and the appreciation of the nominal effective exchange rate (see Figure 2a). In addition, domestic factors related to lower mark-ups, measured by profit per unit of output, and unit labour costs growth also contributed to the deceleration of inflation throughout most of the period (see Figure 2b). The decomposition of the GDP deflator, which measures price dynamics of domestically produced goods and services, indicates that the slowdown of inflation since 2009 has been driven mainly by declines in profit per unit of output.

Figure 2: **Contributions to the final demand deflator**

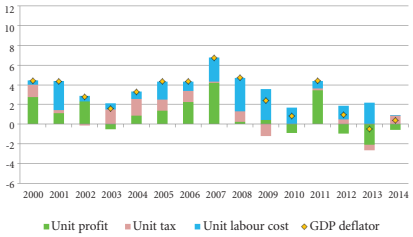
(a) Final demand deflator

(%, percentage points)



(b) GDP deflator

(%, percentage points)



Sources: NSI, own calculations.

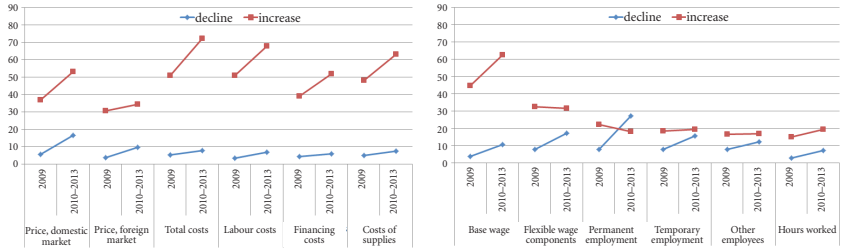
To summarize, macro data suggests that firms have reacted to the combination of negative demand, lower cost of supplies (lower international commodity prices) and external financing shocks (measured by the lower FDI inflows and tightening of credit standards) mainly by reducing prices and profitability and to a lower extent by decreasing labour costs.

4.2. WDN3 survey evidence

In this section, the main results of the questionnaire are presented. All survey results are firm weighted in order to match the number of firms in the underlying population[5].

WDN3 survey data suggests that over the period 2009–2013 the share of firms reporting increases in costs was higher than the share of firms raising prices, implying a compression of profits. Respectively, downward price adjustments exceeded the cases of cost reductions, particularly in 2010–2013. However, both cost and price decreases were more limited in frequency than increases. From the cost components, the percentage of firms reporting growth in labour costs (particularly base wages) remained the highest, followed by the share of firms facing increased costs of supplies. In terms of financing conditions, Figure 3 indicates that both in 2009 and 2010–2013 a relatively low share of Bulgarian firms reported to have faced an increase in financing costs. The estimation of pairwise correlation coefficients points to a high and statistically significant positive correlation between changes in labour costs, financing costs and costs of supplies (see Table 6 and Table 7). In 2010–2013 price and cost increases got more widespread compared to 2009 (see Figure 3). The incidence of price cuts was also higher in 2010–2013.

Figure 3: **Share of firms with increases and declines in the respective component (firm weighted)**



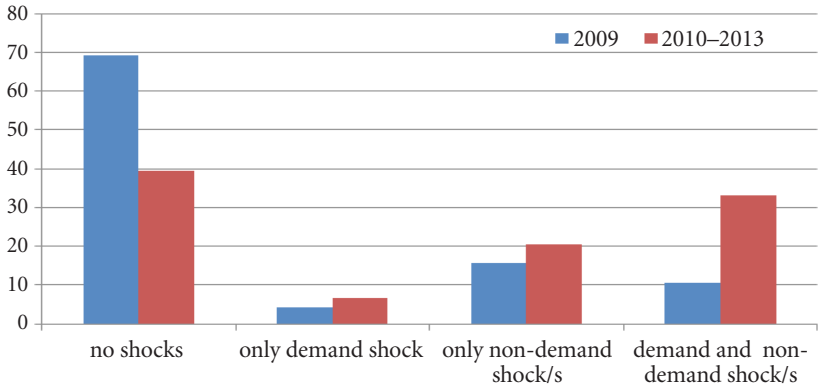
Note: Data is weighted to represent firm population.

Sources: WDN3 survey, own calculations.

[5] In particular, the population has been sub-divided into strata according to sector of activity and number of employees. The weighting coefficients have been calculated as the ratio of the population of firms within each stratum and the number of firms that replied to the survey questionnaire in each stratum. Unless otherwise mentioned, the results given in this article are weighted in this way, and missing replies are left out.

At the same time, in the period 2009–2013 firms were exposed to a number of the explored negative demand and non-demand shocks (access to external financing, access to usual suppliers and clients' ability to pay). WDN3 data suggests that often negatively affected firms were hit by negative demand and non-demand shocks simultaneously (see Figure 4). Whereas in 2009 around 70% of the firms in the sample were hit by none of the explored shocks in the survey, in 2010–2013 the share of unaffected firms decreased to around 40%. Moreover, the share of firms hit by both demand and non-demand shocks increased from around 10% in 2009 to 30% in 2010–2013.

Figure 4: **Composition of firms by type of shocks (demand/non-demand)**



Note: Non-demand shocks include at least on of the following access to external financing, clients' ability to pay, access to usual suppliers.

Sources: WDN3 survey, own calculations.

5. COST- AND PRICE-SETTING DRIVERS OVER THE PERIOD 2009–2013

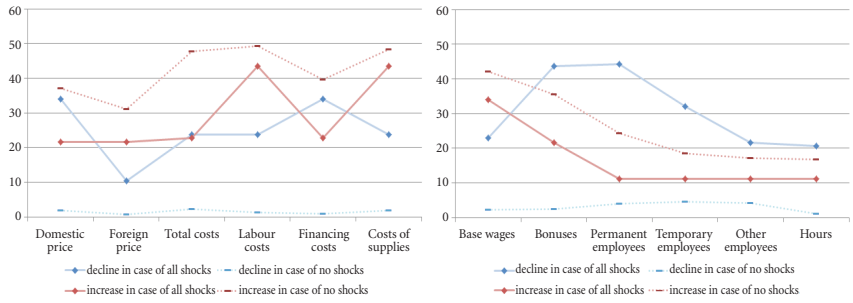
This section investigates the drivers behind cost and price setting, based on self-reported information in the survey, as well as within a descriptive and multivariate regression framework with the available information in the survey for different sub-groups of firms. Previous WDN studies have found that a number of factors are relevant for price- and cost-setting practices of firms. Among them are firm-level characteristics (such as type of sector, firm size, degree of competition, export orientation of their production, structure of costs), workforce characteristics, the macroeconomic environment and institutional factors.

5.1. Descriptive evidence

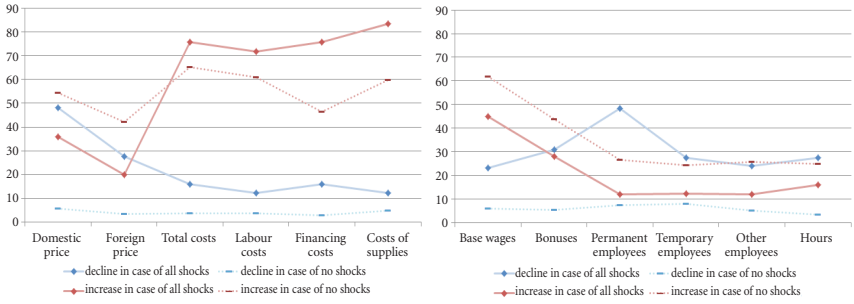
Descriptive WDN3 evidence provides the possibility to compare the price and cost setting reactions for different sub-groups of firms and suggests that firms' responses depend to a high extent on the macroeconomic conditions they were exposed to. Looking at two extreme groups of firms – those experiencing all explored negative shocks at once, and those facing no negative shocks, is indicative for the role of shocks and the degree of firm-level heterogeneity in the period. Firms being hit by negative demand, external financing, client's ability to pay and access to suppliers shocks at once, were much more likely to reduce prices and less likely to increase them compared to firms not hit by any of these negative shocks (see Figure 5). Similarly, cost decreases were more pronounced for negatively affected firms in both 2009 and 2010–2013. The effect of shocks on cost increases however seems to have depended on other factors as well. Firms that were hit by negative shocks in 2009 were less likely to increase costs, which is suggestive of their efforts to optimize production costs after the onset of the global financial crisis. Contrary to that, firms that were negatively affected by shocks in 2010–2013 reported an increase in costs (particularly costs of supplies and financing costs) to a larger extent compared with firms that experienced no shocks.

Figure 5: **Percentage of companies, changing the respective indicator in the case of all shocks versus no shocks, firm weighted**

(a) 2009



(b) 2010–2013



Notes: "All shocks" refer to a simultaneous decline in demand, decreased access to external financing, decreased customers' ability to pay and lower access to usual suppliers. "No shocks" refer to a situation without a decline in these factors.

Data is weighted to represent firm population.

Sources: WDN3 survey, own calculations.

The more stringent cost-setting behaviour of negatively affected firms applies for labour costs as well (see Figure 5). The incidence of reductions in all labour cost components among negatively affected firms exceeded the one in firms experiencing no negative shocks. Furthermore, firms exposed to unfavourable economic conditions were more likely to reduce most labour cost components (except for base wages) than to increase them, particularly bonuses and permanent employees. Labour shedding remained the most prevalent downward adjustment strategy to shocks in 2010–2013. These results are consistent with the macro evidence of protracted unemployment increase in the post-crisis period and the relatively high wage growth.

Overall, downward wage flexibility has been maintained for firms affected by negative shocks. Prices were slightly more flexible downwards than wages for firms hit by all shocks.

Descriptive WDN3 results indicate that price and cost changes vary more between firms from different sectors than size-groups (see Figure 6). Moreover, the sectoral heterogeneity in the price change frequency, measured by the sectoral standard deviation of the percentage of firms changing prices for each frequency sub-group, seems higher than that of wage change frequency for 2010–2013 (see Table 5 in the Appendix).

Firms' price- and cost-setting behaviour, on the other hand, did not vary much with the composition of the workforce or the share of labour in total costs on a descriptive level (see Figure 6). However, firms with a lower share of low-skilled

workers tend to have been slightly less likely to increase costs and prices in 2009.

The role of the degree of competitive pressure for firms' price and cost setting policies in the survey is indicated by: (1) the different cost and price-setting policies in firms, relying mostly on foreign compared to domestic revenues and (2) the variation in firms' price setting between firms following more dependent versus more independent price-setting rule (Figure 6).

On a descriptive level there are some indications of higher price and wage flexibility among firms, following more independent price-setting practices. As could be expected, such firms changed prices and wages more often and also applied inflation indexation more frequently (see Table 1).

Table 1: **Percentage of firms from those in the respective price-setting rule group, applying the respective price and wage-setting strategy**

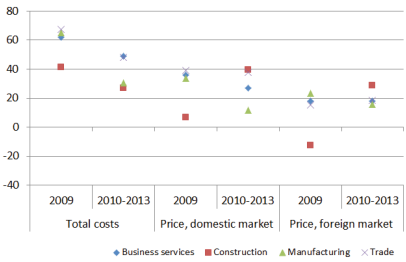
	2010–2013							
	Domestic market				Foreign market			
	depend-ent	inde-pendent	other	**Total**	depend-ent	inde-pendent	other	**Total**
Frequent wage change*	31.6	45.2	41.6	**41.5**	30.4	44.7	0	**37**
Frequent price change*	57	64.8	60.3	**54.8**	17	25.1	37	**22.5**
Inflation indexation	20.5	32.3	36.5	**29.3**	27.5	32.1	24.8	**30**

** Once a year or more frequently.*

Source: WDN3 survey.

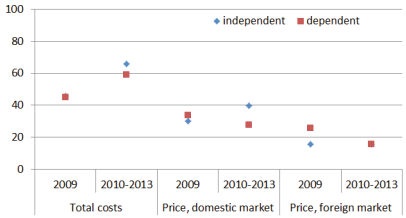
Figure 6: **Difference between the share of firms with increases and declines in: *total costs, prices on the domestic market* and *prices on foreign markets*, broken down by main firm characteristics (firm weighted)**

(a) by sector

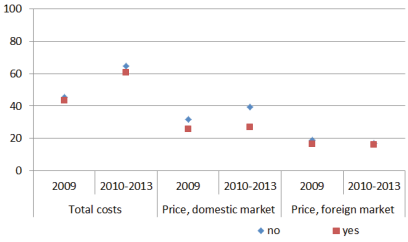


(b) by size

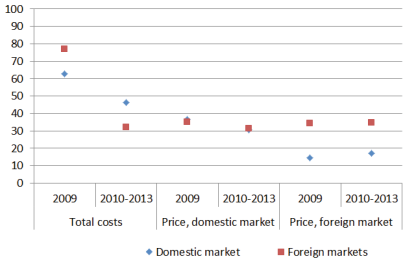
(c) by dependency of price-setting rule



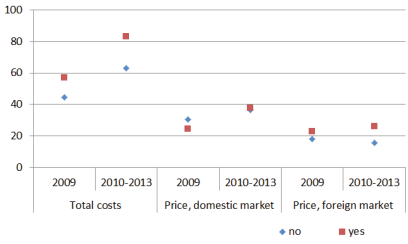
(d) by main source of revenues



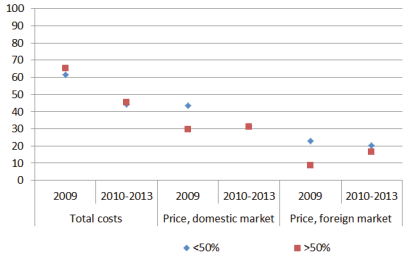
(e) by firm-level agreement



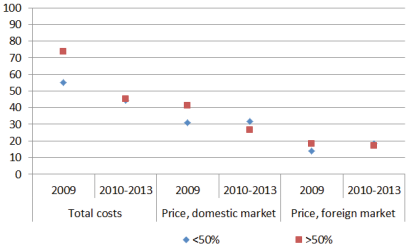
(f) by industry level agreement



(g) by high labour share



(h) by high share of low-skilled workers



Sources: WDN3 survey, own calculations.

Descriptive WDN3 results also suggest that labour market institutions tended to play a stronger role for cost than for price-setting, with more increases taking place in firms which applied collective bargaining agreements (see Figure 6). Wage bargaining institutions in particular have an impact on some features of wage setting that determine the aggregate degree of real wage rigidity: the frequency and the degree of wage indexation and the incidence of price declines. Firms applying collective bargaining, both on the firm and industry level, as well as firms with a higher share of minimum wage employees changed

wages less frequently than firms not covered by such agreements (see Table 2). Whereas the presence of industry level agreements did not seem to affect the prevalence of wage indexation to inflation, firms with firm-level agreements applied wage indexation less frequently. Firms with a higher share of minimum wage and minimum social security threshold employees also tended to be less likely to apply wage indexation to inflation. Moreover, even though the incidence of wage cuts did not seem to vary substantially by the presence of firm-level agreements, firms applying industry level agreements did not cut wages in the period 2009–2013. A higher share of minimum wage employees increased downward nominal wage rigidity and was associated with more common wage freezes.

Table 2: **Wage-setting practices in relation to institutions, percentage of firms (firm weighted)**

Wages	Collective wage bargaining				% employees at minimum wage		% insured at minimum threshold	
	firm-level		outside the firm firm-level					
	No	Yes	No	Yes	<50%	>50%	<50%	>50%
Indexation before 2009	26.3	22.3	26	23.9	26.1	24.4	28.8	21.7
Indexation, 2009	26.6	19.8	25.7	27.1	27.5	18.4	29.5	20.2
Indexation, 2010–2013	29.9	25.6	29.7	29.9	30.5	26.6	33.3	24
Frequent wage changes* before 2009	50.2	24.2	47.1	20.2	48.4	40.6	46	50
Frequent wage changes*, 2009	52.7	20.9	49.1	20.1	47.3	45.2	45.2	51.7
Frequent wage changes*, 2010–2013	43.4	26	41.8	20.7	41.9	35.5	37.8	47.5
Wage freezes, 2009–2013	14.4	18.7	15.8	12.6	14.5	23.3	15.8	17.1
Wage cuts, 2009–2013	5.9	4.4	5.9	0	6	4	5.7	5.8

** Once a year or more frequently.*

Source: WDN3 survey.

The variation of firms' responses on a descriptive level is a prerequisite to explore the relative importance and significance of these factors more thoroughly within a multivariate regression framework.

5.1.1. Self-reported reasons for price setting

The WDN3 survey gathers self-reported evidence of the relative importance of the factors behind price changes. Firms were asked to evaluate the relevance of a number of popular factors such as wage or investment costs, intermediate input costs, product quality, prices of competitors, changes in demand, inflation indexation and productivity changes for their price change decisions on a scale from 1 (not relevant) to 4 (very relevant).

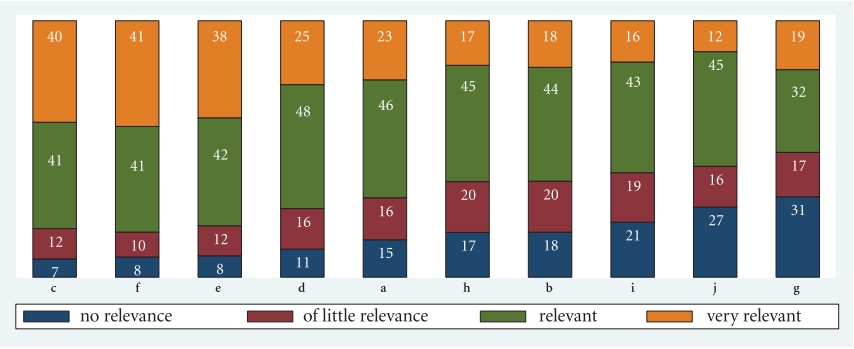
Similarly to previously presented descriptive evidence, the changes in macroeconomic conditions were among the most popular drivers behind price setting. Firms indicated intermediate input costs as one of the most relevant driving forces behind price changes, which could be related to the substantial commodity price changes on international and domestic markets in the years both prior to 2010 and in the period 2010–2013 and their leading role for inflation dynamics. A similarly high degree of relevance for price setting was also given to demand changes and competitors' prices, followed by product quality (see Figure 7). This result is probably unsurprising in a period of more frequent negative demand shocks, overall economic uncertainty and environment of increased competition.

Wage and investment costs were not so relevant for price setting, even though they are given a slightly higher relevance relative to WDN2 survey results, Vladova (2012). Regulatory changes, inflation indexation and productivity considerations were indicated as least relevant for price changes.

Even though sectoral differences are not very pronounced, input prices appear to be slightly more relevant in the industry and trade sub-sectors, whereas product quality seems to play a more important role in the construction sector. Competitive prices are likely to be more relevant in the trade and services sub-sectors, whereas wage costs – in the more labour intensive construction sector.

There are some variations in the relevance of factors by firm-size as well. Larger companies with more than 200 employees found input and competitors' prices as well as demand and product quality more relevant for price setting than smaller companies. Regulatory changes are less relevant for price setting in foreign-owned companies.

Figure 7: **Relevance of factors in price setting, firm weighted**



Note: (a) Wage costs, (b) Investment costs, (c) Input prices, (d) Product quality, (e) Competitors prices, (f)Demand, (g) Regulatory changes, (h) Inflation indexation, (i) Productivity, (j) Other.

Sources: WDN3 survey, own calculations.

5.1.2. The wage-price link

As indicated in the macro data evidence part, it can be hard to distinguish on the basis of macro data whether cost and price changes are co-moving due to exogenous factors or whether they are induced by each other. An important aspect of the cost-price relationship, which is explored by the WDN3 survey, is related to the wage-price link, because compared to the determination of other cost components, wage setting is more likely to be time dependent due to the limitations of contractual arrangements and labour market institutions, and firms may not be able to adjust wages at any given moment. One aspect of the relationship is related to the extent to which wage and price changes directly influence each other. Another aspect is related to the flexibility of wages and prices to respond to changes in the economic conditions, so that the effects of shocks on firms' profits and real outcomes can be smoothed.

WDN2 survey results suggest that the direct wage-price link in Bulgaria is relatively weak (Vladova, 2012), which can be attributed to the combination of productivity convergence and the overall low labour share in the economy (if we measure it by compensation of employees in gross value added). Indications of a relatively weak wage-price link within the WDN2 survey results were provided by the low relevance of labour costs for price changes6, the relatively low share of firms (around 27%) stating to have a link between wages and

[6] Around 36% (18%) claimed that labour cost increases (declines) were relevant or very relevant for price increases (declines), resulting in a relatively low score of importance of the labour cost factor for price changes.

prices and the low share of firms having a policy of adapting changes in base wages to inflation (around 25%) (Vladova, 2012). Moreover, only around 8% of firms reported a strong link between the time concentration of wage and price changes.

The WDN3 questionnaire explores again the wage-price link and whether it has changed in the new survey period. The wage-price link in the WDN3 survey is explored directly by the questions on the incidence of inflation indexation, the relevance of wage costs for price changes, as well as by the question on firms' reaction to minimum wage and minimum social security threshold increases. The WDN3 survey offers the additional possibility of an indirect investigation of the correlation and coincidence between wage and price changes, as well as between wage and price change frequency.

Although WDN3 survey results confirm that the direct wage-price link is relatively weak, there are some indications that it has strengthened in the period 2010–2013. The weak link implies that the factors which drove wage and price changes in this period were rarely directly related to the change in the other component.

Indexation and adjustment of wages to inflation The role of inflation for wage setting is still low, measured by the degree of inflation indexation in Bulgaria. Around 25.6% of firms applied some form of inflation indexation in the period prior to 2010 according to WDN3 data and the evidence is very similar to WDN2 results (around 24%) (Lozev et al., 2011). In the low-inflationary period 2010–2013 inflation indexation practices became more widespread and 29.2% of the firms stated to have aligned their wage growth with inflation (Paskaleva, 2016).

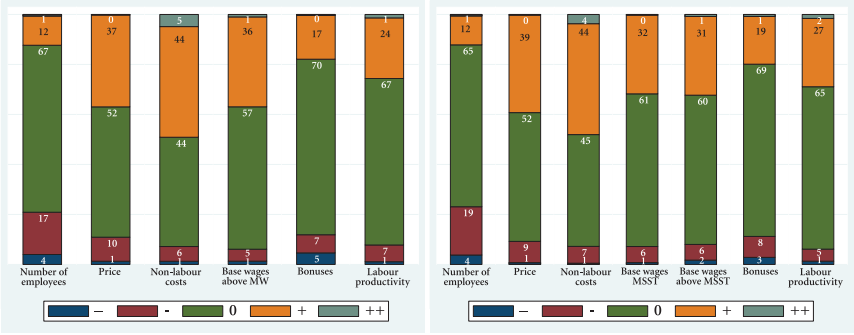
The changes in minimum wages and social security thresholds are among the main institutional drivers of wage increases in the economy. These institutional instruments are typically increased for wage, price and productivity convergence reasons. Even though WDN3 survey results indicate that the employees earning the minimum wage in 2013 were around 20% and those at the social security thresholds – around 40%, there are some indications that there are spillover effects on wages of higher paid employees.

Relevance of wage costs for price changes As indicated previously, wage costs are not the main factor behind price changes. Around 23% of the firms reported wage costs as very relevant for price changes. Input costs, changes in demand and competitors' prices are reported as very relevant for price setting by a higher share of firms (see Figure 7).

The WDN3 survey explored which combinations of strategies firms applied to offset the effects of minimum wage/minimum social security threshold increases on their profits in the period 2010–2013[7] (see Figure 8). A number of important channels were analyzed, including changes in prices, non-labour costs and some labour cost components. Since firms were exposed simultaneously to a number of exogenous shocks, their reactions were also influenced and limited by the overall conditions they were operating in. Moreover, the questions referred to reactions over an extended period of time, from 2010 to 2013, and may therefore incorporate second-round effects as well. A majority of the firms did not change the explored components as a reaction to minimum wage/minimum social security threshold (MSST) increases. A predominant share of the firms which reacted followed a combination of price and cost increasing strategies to expand production capacity and increase productivity. Around 37% (39%) of the firms managed to compensate the effects of minimum wage (social security threshold) increases by raising prices (around 77% of the firms with positive price reactions to MSST increases coincided with the ones with price increases as a reaction to the minimum wage increases). A smaller percentage of the firms (around 10%) reduced prices and applied cost component decreases to maintain profitability.

Figure 8: **Adjustment strategies to minimum wage/minimum social security threshold increases in 2010–2013 (firm weighted)**

(a) Minimum wage **(b) Minimum social security threshold**



Note: (–): strong decline, (-): decline, (0): no change, (+): increase, (++): strong increase

Sources: WDN3 survey, own calculations.

[7] More specifically, the questions gather information on how each of the respective components has changed following the minimum wage/minimum social security threshold increases in the period 2010–2013. The analyzed components include the number of employees, the price of the main product/service, non-labour costs, base wages of employees above the minimum wage/minimum social security threshold, flexible wage components, productivity. The answer options vary from 1 (strong decline) to 5 (strong increase).

Synchronization between the directions of price and wage changes Even though the direct link between prices and wages was relatively weak, there are some indications that the directions of their changes were synchronized, particularly for firms not experiencing negative shocks. According to the respective correlation coefficients base wage increases (declines) were less likely to coincide with domestic price increases (declines) in the cases when firms were hit by negative shocks, Table 3. This may be due to the slightly lower downward wage flexibility compared to price flexibility.

Table 3: **Correlation coefficients between wage and domestic price changes, Spearman's rank correlation coefficient**

	All shocks	No shocks	Total
2009	0.0	0.4	0.3
2010–2013	0.06	0.5	0.3

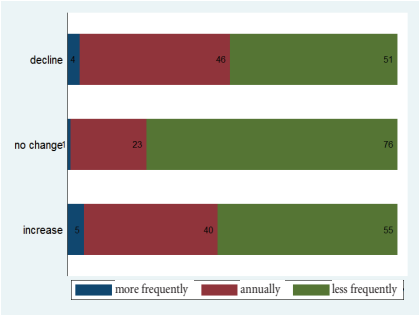
Note: The input variables, used for the test are ordinal and vary from 1 (strong decrease) to 5 (strong increase).
Source: WDN3 survey.

WDN3 data suggests that the frequency of wage changes increased in 2009 together with the need to adjust wages, and has declined in 2010–2013 relative to previous periods, Paskaleva (2016).

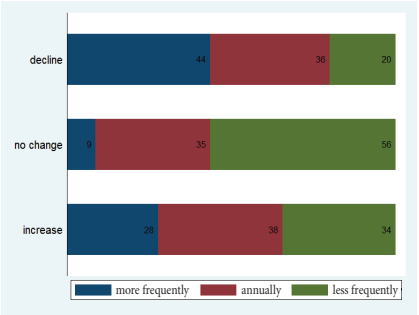
Respectively, the need to adjust prices and wages was tackled with higher frequencies of these changes in the respective firms (see Figure 9). While the frequencies of wage increases and decreases were relatively similar, the frequency of price declines was higher than the one of price increases, which is an evidence of downward price flexibility.

Figure 9: **Frequency of wage and price change by direction of change, 2010–2013, firm weighted**

(a) Wage



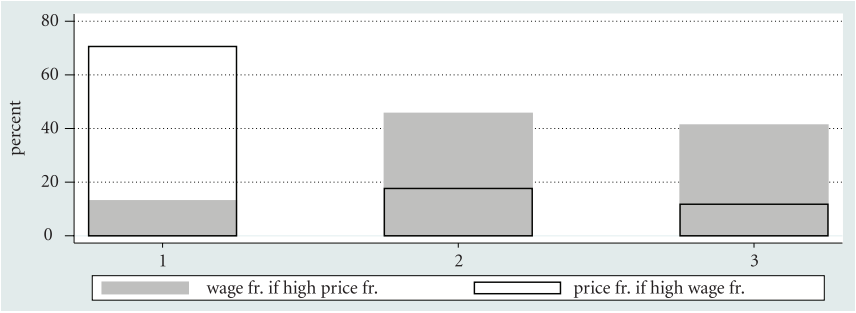
(b) Price



Sources: WDN3 survey, own calculations.

Link between the frequencies of wage and price changes Most firms having high wage change frequency had also high price change frequency (more than 60% of the firms) in the period 2010–2013, irrespective of the macroeconomic shocks they were exposed to. Survey results reveal that it was less likely that firms having high price change frequency also had high wage change frequencies. This may indicate that the determinants of price change frequency more often differed from wage related factors, than the other way round (see Figure 10).

Figure 10: **Wage/price change frequency distribution of firms in 2010–2013 having at least annual price/wage change frequencies, firm weighted**



(1) more frequently than once a year, (2) annually, (3) less frequently than once a year.

Note: The figure shows the frequency distribution of wage changes (in percentage of firms) for firms with at least annual price change frequency (in white transparent) and the frequency distribution (in percentage of firms) of price changes of firms with at least annual wage change frequency (in grey).

Sources: WDN3 survey, own calculations.

5.2. Probit estimates

Probit models are estimated in order to control for the simultaneous effect of the previously presented exogenous factors for price and cost setting. The probit estimates also allow us to evaluate the relative importance and significance of the potential factors for price and cost setting.

The estimated probit models have the following general form:

$$Pr\,(Y = 1) = \Phi(X'\beta) \qquad \text{for } i = 1, 2, ..., N \tag{1}$$

where Y is a dummy variable capturing the occurrence of the explored outcome (Y equals one if the response of firm i falls into a certain category and zero otherwise), X is a vector of firm-specific, institutional and other characteristics, Φ is the cumulative distribution function of the standard normal distribution, N is the number of firms and β is the vector of coefficients which captures the

effect of the explanatory characteristics on the probability of observing the outcome.

In our case the dependent variables (Y in equation (1)) are either the increases or decreases of the respective cost and price components[8] (see Tables 10–12, Appendix) or high frequency of price and wage changes[9] (see Tables 13–14, Appendix). The wage-price link is explored by introducing regressions with dependent variables for the presence of inflation indexation (to explore the factors behind a stronger influence of price changes on wage setting) and a self-indicated high relevance of labour costs for price setting (to explore the factors behind a stronger influence of labour cost changes on price setting) (see Table 15, Appendix).

A number of exogenous controls (matrix X in equation (1)), available in the WDN3 survey, are included in the regressions, such as firm-specific characteristics (economic sector, size, ownership type, structural distribution of firms), institutional and macroeconomic environment factors, see Table 8. The macroeconomic conditions under which firms operated are accounted for by including two types of shock indicators, signifying when firms were negatively affected by either a demand or non-demand shocks (consisting of at least one of the following: decline in the access to external financing, decrease in customers' ability to pay or reduced access to usual suppliers). Additionally, the interaction term of demand and non-demand shocks is controlled for. A dependent price-setting dummy is introduced in the regressions (indicating the firms whose price is determined either by a regulator, parent company or the main client) as a proxy for lower product market competition. The indicator capturing alternative margins of labour cost adjustment in the regressions is the share of bonuses in the wage bill.

Tables 9 and 11 present the probit estimates of the covariates of cost and price component increases and decreases respectively. Tables 10 and 12 show the probit estimates for each of the labour cost components' increases and declines. Table 13 contains multivariate probit estimates for the determinants of frequent wage and price changes, which take into account that wage and price change frequency decisions are taken simultaneously. Table 14 explores the impact of the features described in the previous section on wage change frequency in different sub-periods. Table 15 summarizes the covariates of inflation indexation and the labour cost relevance for price setting.

[8] In the case of price and cost changes, dummy variables for the decrease or increase of the respective component were used and explored separately.

[9] In the case of price/wage change frequency, a dummy variable for at least an annual change in prices/wages is used.

Multivariate analysis results are in line with self-reported firms' responses. The significance of the estimated coefficients and the size of the marginal effects indicate that the changes in the **macroeconomic conditions** are among the main covariates of price and cost changes in the period 2009–2013. Firms experiencing negative demand shocks were more likely to reduce prices and costs in 2009. On the other hand, the cost-related non-demand shocks tended to push up costs, except for the cases when they coincided with negative demand shocks, which significantly mitigated the upward effect on costs (Tables 9 and 11). At the same time, the presence of negative demand shocks was associated with a higher price change frequency, which indicates a state-dependent element of price setting (Tables 13). In terms of labour cost components, the presence of negative shocks exacerbated downward employment and flexible wage adjustments (Table 12). At the same time, the combination of negative demand and non-demand shocks limited the extent of base wage increases (Table 10). The practice of inflation indexation of wage changes was also less widespread in firms experiencing negative demand shocks (Table 15).

Another important factor for the extent and direction of price and cost changes was the **economic sector** firms were operating in. Firms in the manufacturing sector were less likely to increase prices and more likely to reduce costs in 2009. Similarly, price increases among firms in the business services sector were less widespread (Tables 9 and 11). In terms of labour cost components, firms in the construction sector were more likely to reduce temporary and agency workers in 2009 and tended to increase working hours, whereas firms in the business services sector were less likely to reduce base wages in 2010–2013 and more often laid off agency workers (Tables 10 and 12).

The **region** in which the firm was operating is also an important factor behind cost and price changes (Tables 9 and 11). Firms in the South-Western region of the country were less likely to increase costs, particularly labour costs throughout 2009–2013, and more likely to increase prices in 2009. Particularly wage and employment declines were more pronounced and wage increases less so in the South-Western region of the country (Tables 10 and 12). Moreover, firms in the South-Western region of the country tended to change wages less frequently (Tables 14). Labour costs were more frequently relevant for price changes in companies in the South-Western region (Table 15).

Another important covariate of cost changes were various aspects of **labour market institutions**. A higher share of minimum wage employees coincided with more likely cost increases and less likely cost declines (Tables 9 and 11). Interestingly, a higher MSST share was associated with less likely cost increases.

On the contrary, firms with an industry level agreement more likely increased costs, whereas firm-level agreements were associated with less likely price increases (Tables 9 and 11). In terms of specific labour cost components, the presence of a firm-level agreement was likely to limit wage increases and was associated with less frequent wage changes in 2010–2013. Moreover, the presence of firm-level agreements is more likely observed in firms with a weaker link from labour cost changes to prices (Table 15), implying that this type of agreements enhances firms' flexibility to adjust labour costs, without affecting prices. On the other hand, employment and base wage increases were stronger in companies, applying an industry level agreement (Tables 10 and 12). Firms having predominantly minimum wage employees changed wages less frequently in 2010–2013.

The **degree of competition** to which firms were exposed, was also an important factor for their cost and price setting decisions. WDN3 evidence suggests that firms relying mostly on foreign revenues, which are possibly more exposed to international competitive conditions, were likely to limit their cost increases in 2009 (Tables 9 and 11). Moreover, firms exposed to international competitive pressures and relying mostly on foreign revenues were less likely to indicate wage costs as relevant for price changes (Table 15).

WDN3 findings suggest that the extent of dependence of the applied **price-setting rule** affects mainly price-setting practices. Interestingly, firms following more dependent price-setting rules were more likely to reduce prices in the survey period and less likely to increase them (Tables 9 and 11). The practice of wage indexation is stronger in firms, following more independent price-setting strategies (Table 15).

Previous WDN evidence suggests that **the labour force composition** has been more relevant for pricing than for cost- and wage-setting decisions (Druant et al., 2009; Vladova, 2012). Conversely, WDN3 results indicate that firms with a higher labour share were more likely to reduce wages in 2009, even though there is no evident effect on price changes. A higher labour share was also associated with more likely inflation indexation of wage changes in 2010–2013, probably because inflation was relatively low at that time (Table 15).

WDN3 evidence indicates that a higher **share of bonuses in the wage bill** is associated with more likely cost increases in 2010–2013 and less likely cost declines in 2009. Furthermore, a higher share of bonuses in the wage bill is associated with lower price change frequencies in 2010–2013 (Tables 13). The link from prices to wages, on the other hand, measured by inflation indexation of wages, is more likely in firms with a high share of bonuses in the wage bill (Table 15).

To summarize, changes in costs and prices were mainly the result of changed macroeconomic conditions. The sectoral structure of firms also played a role. Additional relevant determinants of cost changes are related to the structure of the wage bill/employment and labour market institutions, whereas other more relevant factors for price changes are connected with the price-setting rule that firms are following. The stronger relevance of cost-push factors, such as access to external financing, clients' ability to pay, access to suppliers' shocks and labour market institutions, for cost rather than price setting decisions also suggests a relatively weak pass-through of cost increases to prices over the period 2009–2013.

6. CONCLUSIONS

This paper explores the factors behind price- and cost-setting behaviour of Bulgarian firms over the period 2009–2013, using WDN survey data, and adds to existing evidence in the following manner.

On one hand the results provide some indications of downward price flexibility in the explored period (2009–2013) both in terms of frequency of price changes and incidence of price declines. Survey results indicate that downward price adjustment strategies were widespread, particularly compared to cost declines in this period. However, even though prices were reduced more frequently than wages, downward wage flexibility has been maintained for firms affected by negative shocks.

Furthermore, the results indicate responsiveness of price and cost changes to the macroeconomic conditions, which is supported by both descriptive and multivariate regression findings. Firms being hit by all negative shocks at once were much more likely to reduce prices and less likely to increase them in the period 2009–2013. Similarly, cost decreases were more pronounced for negatively affected firms in both 2009 and 2010–2013. Whereas the presence of non-demand shocks (such as external financing, customers' ability to pay and access to suppliers shocks) tended to push up costs, their coincidence with demand shocks was likely to significantly limit cost increases and to coincide with cost and price declines. In terms of single labour cost components, firms hit by all demand and non-demand shocks simultaneously were more likely to reduce all labour cost components than to increase them in 2009–2013. As suggested by previous evidence, bonuses and permanent employment cuts were a preferred downward adjustment strategy for negatively affected firms, which is consistent with the macro evidence.

Furthermore, the main covariates of cost and price changes differ to a certain extent. Whereas cost changes tend to be more likely related to changes in the access to external financing, costs of supplies, the structure of the wage bill/ employment and labour market institutions, price changes depend more on the demand conditions and on the extent of dependence of the price-setting rule they are following. In terms of labour cost components, whereas industry level agreements affected both wages and employment, the prevalence of minimum wage and minimum social security threshold employees, as well as the presence of firm-level agreements were more relevant for wage than for employment changes. Moreover, firms relying mostly on foreign revenues were more cautious in their cost increases. Interestingly, a high labour share is not found to have a hampering effect on wage or price flexibility. This is possibly connected with the evidence, that firms with a high labour cost share were more likely to reduce base wages in 2009. As expected, a high share of bonuses in the wage bill tended to enhance wage flexibility.

The evidence of the predominant role of macroeconomic conditions for price setting is also supported by self-reported reasons for price changes by firms, which indicate that intermediate input costs, the price-setting behaviour of the main competitors and demand changes are among the main drivers behind price setting. Product quality also plays an important role. Labour costs are stated to be less relevant for pricing decisions.

WDN3 survey results do not provide indications of strong pass-through effects of cost increases to prices in the period 2009–2013, particularly for firms hit by negative shocks. Over the period, prices were more likely to decline, even for firms with cost increases. Moreover, the possible cost-push effects on prices from non-demand shocks (including access to external financing, access to usual suppliers and clients' ability to pay shocks) and labour market institutions are limited, since they are not significant covariates of price changes, as indicated by regression results.

The WDN3 survey confirms that the wage-price link is relatively weak with some indications that the link has increased in the new survey period with the continuous wage and price convergence processes. The role of inflation for wage setting, measured by the degree of inflation indexation in Bulgaria, is still low, but have increased in 2010–2013. Moreover, more than one fourth of the firms indicated to have increased prices as a reaction to minimum wage and minimum social security threshold increases. Conversely, regarding the role of wage costs for price changes, around one third of the firms selected wage costs as very relevant for price changes. Input costs, demand changes and

competitors' prices were stated as much more relevant factors for price changes than wage costs.

Probit regression results show that the link from wage costs to prices is stronger in firms operating in the South-Western region and is weaker in firms, exposed to stronger competition and those applying firm-level agreements. In terms of the role of prices for wage changes on the

other hand, wage indexation to inflation was more widespread among firms with a high share of bonuses in the wage bill and a high labour share and less widespread in firms applying a dependent price-setting mechanism, as well as in firms experiencing negative shocks.

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APPENDIX

Table 4: **Population and WDN3 sample composition**

Sector/Firm size	5–19	20–49	50–199	200+	Total
Population, NSI, 2012, 39 925 firms (1 112 542 employees)					
Manufacturing (sector C, NACE rev. 2)		6.4	4.1	1.0	11.5
Construction (sector F)		2.4	1.2	0.2	3.8
Trade (sector G, NACE rev. 2)	35.1	5.8	1.9	0.2	43.0
Other non-public services (sectors H–J, L–N, R, S, NACE rev. 2)	33.5	5.5	2.1	0.5	41.7
Total	68.6	20.1	9.4	2.0	100
WDN3 sample composition, August – November 2014, 528 firms (14 545 employees)					
Manufacturing (sector C, NACE rev. 2)		5.7	3.6	1.3	10.6
Construction (sector F)		2.8	1.1	0.2	4.2
Trade (sector G, NACE rev. 2)	37.1	5.7	1.3	0.4	44.5
Other non-public services (sectors H–J, L–N, R, S, NACE rev. 2)	32.8	5.5	2.1	0.4	40.7
Total	69.9	19.7	8.1	2.3	100

Sources: NSI, WDN3 survey (Bulgaria).

Table 5: **Frequency of price and wage changes across sectors, firm weighted**

WAGES				
Prior to 2009				
	more frequently than once a year	yearly	less than frequently once a year	never
Total	**1.5**	**38.9**	**45.4**	**14.3**
Manufacturing	0	35.4	50.3	14.3
Construction	0	58.5	19.2	22.3
Trade	1.7	39.8	45	13.5
Business services	1.9	37.1	46.5	14.4
Standard deviation	*1.0*	*10.7*	*14.2*	*4.1*
2009				
	more frequently than once a year	yearly	less frequently than once a year	never
Total	**3.7**	**35.7**	**46.8**	**13.8**
Manufacturing	3.7	29.9	54	12.4
Construction	4.5	48.3	32.6	14.6
Trade	3.8	36.6	46.6	13.1
Business services	3.5	35.3	46.3	15
Standard deviation	*0.4*	*7.7*	*8.9*	*1.2*
2010–2013				
	more frequently than once a year	yearly	less frequently than once a year	never
Total	**3.4**	**31.5**	**50.4**	**14.6**
Manufacturing	0	31.8	54	14.3
Construction	4.2	31.9	41.4	22.3
Trade	2.9	33.7	48.7	14.7
Business services	4.7	29.2	52.2	14
Standard deviation	*2.1*	*1.9*	*5.6*	*4.0*

PRICES					
2010–2013					
	daily to monthly	quarterly to half yearly	yearly	less frequently than once a year	never
Total	**7.1**	**16.4**	**34.5**	**35.9**	**6.3**
Manufacturing	2.2	21	31.8	38.5	6.5
Construction	11.8	16.9	50.7	15.5	5.2
Trade	10.5	17.8	33.2	33.2	5.3
Business services	4.1	13.6	35.2	39.7	7.3
Standard deviation	*4.7*	*3.0*	*8.8*	*11.2*	*1.0*

Source: WDN3 survey.

Table 6: **Correlations between the relevance of different adjustment strategies in 2009, Spearman's rank correlation coefficient**

Change in	Total costs	Labour costs	Financing costs	Costs of supplies	Base wages	Flex-ible wage compo-nents	Perma-nent em-ployees	Tempo-rary or fixed-term em-ployees	Agency or other workers	Prices, domestic market	Prices, foreign markets
Total Costs	1										
Labour Costs	0.6*	1									
Financing costs	0.4*	0.5*	1								
Costs of supplies	0.5*	0.6*	0.5*	1							
Base wages	0.3*	0.4*	0.2*	0.4*	1						
Flexible wage components	0.2*	0.2*	0.2*	0.2*	0.5*	1					
Permanent employees	0.1*	0.2*	0.2*	0.2*	0.4*	0.5*	1				
Temporary employees	0.1*	0.1*	0.1*	0.2*	0.3*	0.3*	0.4*	1			
Agency workers and others	0.05	0.07	0.1*	0.1*	0.1*	0.3*	0.3*	0.5*	1		
Prices, domestic market	0.2*	0.2*	0.1*	0.3*	0.3*	0.3*	0.3*	0.1*	0.1*	1	
Prices, foreign markets	0.2*	0.1*	0.2*	0.2*	0.2*	0.3*	0.2*	0.2*	0.2*	0.5*	1

Note: The star indicates significance at 10% level or lower. Each of the input variables for the test is ordinal and varies from 1 (strong decline) to 5 (strong increase).

Source: WDN3 survey.

Table 7: **Correlations between the relevance of different adjustment strategies in 2010–2013, Spearman's rank correlation coefficient**

Change in	Total costs	Labour costs	Financing costs	Costs of supplies	Base wages	Flexible wage components	Permanent employees	Temporary or fixed-term employees	Agency or other workers	Prices, domestic market	Prices, foreign markets
Total Costs	1										
Labour Costs	0.6*	1									
Financing costs	0.4*	0.4*	1								
Costs of supplies	0.6*	0.6*	0.5*	1							
Base wages	0.3*	0.5*	0.2*	0.3*	1						
Flexible wage components	0.1*	0.2*	0.2*	0.2*	0.4*	1					
Permanent employees	0.006	0.1*	0.2*	0.08*	0.3*	0.4*	1				
Temporary employees	0.2*	0.2*	0.2*	0.1*	0.2*	0.3*	0.4*	1			
Agency workers and others	0.02	0.009	0.1*	0.04	0.2*	0.3*	0.5*	0.5*	1		
Prices, domestic market	0.2*	0.2*	0.1*	0.3*	0.3*	0.2*	0.2*	0.07	0.07	1	
Prices, foreign markets	0.1*	0.1*	0.1*	0.2*	0.2*	0.2*	0.2*	0.2*	0.2*	0.5*	1

Note: The star indicates significance at 10% level or lower. Each of the input variables for the test is ordinal and varies from 1 (strong decline) to 5 (strong increase).

Source: WDN3 survey.

Table 8: **Firms' characteristics explored in the paper**

Variable	Variable description
Sector dummies	Dummy variables, based on the sectoral distribution of firms
Size dummies	Dummy variables, based on the size distribution of firms
Multi-establishment	Dummy variable for multi-establishment firm
South-Western region	Dummy variable for firm based in the South-Western region of the country
Mainly foreign revenues	Dummy variable for a firm, relying mainly on foreign revenues
Negative demand shock	Dummy variable, indicating that the firm was hit by a neg ative demand shock in the respective period
Negative non-demand shocks	Dummy variable, indicating that the firm was hit by at least one shock of the following: external financing, clients' ability to pay and access to suppliers shocks in the respective period
Negative demand and non-demand shocks	Dummy variable, indicating that the firm was hit by as well by a demand shock and at least one shock of the follow ing: external financing, clients' ability to pay and access to suppliers shocks in the respective period
High labour share	Firm with more than 60% share of labour costs in total costs
More bonuses in wage bill	Firm with more than 10% bonuses in wagebill
Mostly low-skilled	Firm with more than 50% low-skilled employees
Mostly MW employees	Firm with more than 50% minimum wage employees
Mostly MSST employees	Firm with more than 50% minimum social security threshold employees
Industry agreement	Firm applying industry level collective bargaining agreement
Firm agreement	Firm, applying firm-level agreement
Dependent price setting	Firm with dependent price setting mechanism

Table 9: **Covariates of cost and price increases, probit estimates, average marginal effects**

Change in	Total costs		Labour costs		Financing costs		Costs of supplies		Domestic price		External price	
	2009	2010–2013	2009	2010–2013	2009	2010–2013	2009	2010–2013	2009	2010–2013	2009	2010–2013
Manufacturing	-0.15	-0.19	-0.02	-0.10	-0.02	-0.07	-0.04	-0.12	-0.23*	-0.05	-0.16	-0.08
Construction	-0.17	-0.20	-0.26	0.03	-0.13	0.13	-0.16	-0.11	-0.06	-0.15	-0.09	-0.23
Business services	-0.08	-0.07	-0.13*	-0.06	-0.13*	-0.10	-0.10	-0.11*	-0.13*	-0.03	-0.05	-0.01
20–49	0.04	0.11	0.08	0.13	0.10	0.09	0.07	0.14	0.04	-0.02	0.06	0.08
50+ employees	0.06	0.10	0.07	0.16	0.06	0.13	-0.01	0.12	0.03	0.09	0.03	0.09
Multi-establishment	0.10	0.06	0.03	0.04	0.20*	0.16*	0.21**	0.13	0.27***	0.06	0.12	0.14
South-Western region	-0.16**	-0.08	-0.10	-0.13*	0.00	0.07	-0.04	-0.01	0.10*	0.06	0.10*	0.10
Mainly foreign revenues	-0.19*	0.08	-0.05	0.01	0.01	0.18	-0.02	0.16	0.07	-0.04	0.06	0.08
Negative demand shocks	-0.15	0.08	-0.10	0.06	-0.08	-0.18	-0.22	0.10	-0.25	-0.08	-0.07	-0.31**
Negative non-demand shocks	0.15*	0.19**	0.11	0.27***	0.08	0.15*	0.04	0.18**	0.08	0.10	0.03	-0.07
Negative demand and non-demand shocks	0.05	-0.18	-0.07	-0.27*	-0.08	0.06	0.17	-0.29*	0.09	-0.12	-0.02	0.24
High labour share	-0.07	-0.02	-0.06	-0.01	-0.06	-0.03	-0.09	-0.01	-0.04	-0.09	-0.04	-0.02
More bonuses in wage bill	0.10	0.04	0.09	0.10*	0.12*	0.11*	0.04	0.11*	0.05	0.08	0.03	0.07
Mostly low-skilled	0.03	0.15***	0.02	0.02	0.02	0.04	0.05	0.08	-0.00	0.04	-0.04	-0.06
Mostly MW employees	0.05	0.17**	0.01	0.12	0.03	0.12	0.05	Q 24***	-0.04	0.02	-0.13	-0.08
Mostly MSST employees	-0.08	-0.12*	-0.06	-0.14*	0.00	0.01	-0.16**	-0.18**	-0.10	-0.02	-0.06	-0.05
Industry agreement	0.31*	0.31*	0.23	0.39**	0.05	0.07	0.25	0.26*	0.07	0.02	0.16	0.15
Firm agreement	-0.03	-0.04	-0.09	-0.10	0.06	0.18*	-0.10	-0.14*	-0.02	-0.20*	-0.10	-0.20**
Dependent price setting	0.00	-0.06	0.03	-0.04	-0.10	-0.11	0.02	-0.05	0.02	-0.14*	0.08	0.02
N	375	380	375	380	375	380	375	380	375	380	375	380
pseudo R-sq	0.062	0.103	0.043	0.092	0.063	0.106	0.058	0.107	0.088	0.066	0.075	0.123
chi2	32.22**	48.19***	22.33	45.45***	30.90**	56.08***	29.76**	54.11***	43.77***	34.60**	33.72**	58.11***

Notes: (*), (**) and (***) denote statistical significance at 10, 5 and 1 percent, respectively.
The dependent variable in each of the columns is a dummy variable, taking the value 1, if the respective component is increasing in the respective period and 0 otherwise. The reference category is a firm from the trade sector of size below 20 employees from other than the South-Western region of the country, relying mainly on domestic revenues, having experienced neither a negative demand, nor a non-demand shock, with a lower labour share, less bonuses in the wage bill, not applying industry or firm-level agreement, employing mainly non-MW and MSST employees and following an independent price-setting rule.
Sources: WDN3 survey, authors' calculations.

Table 10: **Covariates of labour cost components' increase, probit estimates, average marginal effects**

	Base wage		Flexible wage components		Permanent employees		Temporary employees		Agency workers and others		Working hours *per* employee	
	2009	2010–2013	2009	2010–2013	2009	2010–2013	2009	2010–2013	2009	2010–2013	2009	2010–2013
Manufacturing	0.06	-0.03	0.14	0.07	0.06	-0.08	0.02	0.03	-0.00	-0.02	0.02	0.07
Construction	0.08	-0.03	0.14	-0.16	0.22*	0.03	0.05	-0.02	-0.13	0.00	0.22**	0.23*
Business services	-0.06	-0.00	-0.04	-0.06	-0.05	-0.04	-0.04	-0.05	-0.07	-0.06	-0.04	0.01
20–49	-0.07	0.03	-0.17*	-0.09	-0.00	-0.06	-0.01	0.02	0.01	0.03	-0.10	-0.06
50+ employees	0.01	0.12	0.03	0.12	0.03	0.04	0.02	0.05	0.10	0.17*	-0.13	-0.04
Multi-establishment	0.07	0.03	0.11	0.07	0.09	0.03	0.04	-0.02	-0.05	0.06	0.03	0.03
South-Western region	-0.01	-0.16**	0.12*	-0.03	0.10*	-0.04	-0.03	-0.10*	0.05	-0.02	0.06	0.07
Mainly foreign revenues	-0.07	0.13	0.03	-0.00	0.00	0.05	0.03	-0.08	-0.02	-0.07	0.18	-0.06
Negative demand shocks	-0.12	0.18	-0.32	-0.14	-0.13	-0.13	-0.06	-0.19	-0.11	-0.27*	-0.97	-0.08
Negative non-demand shocks	0.11	0.18**	-0.04	-0.14*	0.04	0.04	-0.06	-0.09	0.00	-0.16*	-0.01	-0.06
Negative demand and non-demand shocks	-0.02	-0.48***	0.24	0.06	0.06	-0.06	0.14	0.20	0.10	0.33**	0.85	0.06
High labour share	-0.03	-0.02	-0.02	-0.06	-0.00	-0.06	0.01	0.01	-0.00	-0.01	-0.04	-0.04
More bonuses in wage bill	0.10	0.09	0.12*	0.17***	0.07	0.05	-0.02	0.00	-0.09*	-0.04	-0.03	0.04
Mostly low-skilled	-0.04	-0.02	0.00	-0.04	-0.03	-0.08*	-0.02	0.04	-0.01	-0.05	0.00	0.05
Mostly MW employees	0.07	-0.04	0.06	0.02	0.05	-0.12	-0.02	-0.00	-0.06	-0.12	0.08	0.10
Mostly MSST employees	-0.12	-0.09	-0.05	-0.12*	-0.07	-0.04	-0.04	-0.06	-0.00	-0.01	-0.22***	-0.21***
Industry agreement	0.32*	0.44***	0.05	0.20	0.16	0.22**	0.20*	0.25**	0.18*	0.28**	0.08	0.08
Firm agreement	-0.15	-0.27***	-0.02	-0.08	-0.11	-0.02	-0.06	-0.10	-0.09	-0.12	0.07	0.00
Dependent price setting	-0.07	-0.12*	-0.05	-0.07	-0.03	-0.13**	0.00	-0.00	0.02	-0.02	0.01	-0.01
N	375	380	375	380	375	380	375	380	375	363	375	380
pseudo R-sq	0.049	0.146	0.089	0.143	0.085	0.180	0.031	0.073	0.060	0.150	0.157	0.109
chi2	24.81	75.37***	40.76***	66.58***	32.05**	60.39***	10.37	26.33	19.01	48.90***	51.38***	40.99***

Notes: (*), (**) and (***) denote statistical significance at 10, 5 and 1 percent, respectively.
The dependent variable in each of the columns is a dummy variable, taking the value 1, if the respective component is increasing in the respective period and 0 otherwise.
The dependent variable in each of the columns is a dummy variable, taking the value 1, if the respective component is increasing in the respective period and 0 otherwise.
The reference category is a firm from the trade sector of size below 20 employees from other than the South-Western region of the country, relying mainly on domestic revenues, having experienced neither a negative demand, nor a non-demand shock, with a lower labour share, less bonuses in the wage bill, not applying industry or firm-level agreement, employing mainly non-MW and MSST employees and following an independent price-setting rule.

Sources: WDN3 survey, authors' calculations.

Table 11: **Covariates of cost and price decline, probit estimates, average marginal effects**

Change in	Total costs		Labour costs		Financing costs		Costs of supplies		Domestic price		External price	
	2009	2010–2013	2009	2010–2013	2009	2010–2013	2009	2010–2013	2009	2010–2013	2009	2010–2013
Manufacturing	0.08	0.03	0.01	0.03	0.04	0.01	0.02	0.04	0.05	0.03	-0.07	0.03
Construction	0.07	0.06	-0.01	-0.02	0.04	-0.02	0.06	-0.01	0.03	0.06	0.00	0.07
Business services	-0.04	0.00	-0.07*	-0.02	-0.01	-0.02	-0.04	-0.01	-0.00	-0.01	-0.02	-0.01
20-49	-0.01	-0.03	-0.01	0.01	-0.07	-0.03	-0.01	-0.02	0.01	0.08	0.02	0.01
50+ employees	0.05	0.02	0.04	0.06	-0.00	0.02	0.06	0.05	-0.03	-0.01	0.02	0.00
South-Western region	0.04	0.01	-0.04	0.03	-0.03	0.02	-0.01	0.04	-0.03	-0.03	-0.02	0.01
Negative demand shocks	0.14**	-0.01	0.04	-0.56	0.07*	-0.42	0.08*	-0.60	0.08*	0.12	0.13***	-0.02
Negative non-demand shocks	0.03	0.03	0.01	-0.02	0.04	0.05	0.03	0.01	0.01	0.00	0.07*	0.03
Negative demand and non-demand shocks	-0.05	0.09	0.02	0.70	0.01	0.49	0.01	0.67	0.02	0.12	-0.12**	0.11
High labour share	-0.03	-0.05	0.01	-0.02	-0.04	-0.00	-0.02	-0.03	-0.02	0.00	-0.01	0.02
More bonuses in wage bill	-0.06*	-0.04	-0.04	-0.05	-0.02	-0.05	-0.06	-0.05	-0.01	-0.01	-0.03	-0.04
Mostly low-skilled	0.01	0.00	-0.02	-0.00	-0.02	0.01	0.01	-0.03	0.01	-0.05	-0.03	-0.04
Mostly MW employees	-0.04	-0.05	-0.08*	-0.05	-0.07	-0.10*	0.00	-0.05	-0.02	-0.08	0.01	-0.01
Mostly MSST employees	0.02	0.02	0.03	0.02	0.02	0.03	0.01	0.03	0.02	0.06	0.01	0.06
Firm agreement	0.02	0.05	-0.02	0.01	0.00	-0.02	-0.05	-0.02	-0.01	0.06	0.03	0.06
Dependent price setting	0.02	0.06	-0.04	0.05	-0.00	0.01	-0.02	0.02	0.05*	0.12**	-0.04	0.04
N	385	390	385	390	385	390	385	390	385	390	364	390
pseudo R-sq	0.297	0.096	0.431	0.140	0.390	0.171	0.314	0.093	0.358	0.191	0.350	0.148
chi2	56.44***	22.65	54.66***	32.31***	61.35***	33.55***	53.00***	21.43	51.99***	64.00***	36.92***	34.95***

Notes: (*), (**) and (***) denote statistical significance at 10, 5 and 1 percent, respectively.
The dependent variable in each of the columns is a dummy variable, taking the value 1, if the respective component is declining in the respective period and 0 otherwise. The dependent variable in each of the columns is a dummy variable, taking the value 1, if the respective component is increasing in the respective period and 0 otherwise. The reference category is a firm from the trade sector of size below 20 employees from other than the South-Western region of the country, relying mainly on domestic revenues, having experienced neither a negative demand, nor a non-demand shock, with a lower labour share, less bonuses in the wage bill, not applying industry or firm-level agreement, employing mainly non-MW and MSST employees and following an independent price-setting rule.

Sources: WDN3 survey, authors' calculations.

Table 12: **Covariates of labour cost components' decline, probit estimates, average marginal effects**

	Base wage		Flexible wage components		Permanent employees		Temporary employees		Agency workers and others		Working hours *per* employee	
	2009	2010–2013	2009	2010–2013	2009	2010–2013	2009	2010–2013	2009	2010–2013	2009	2010–2013
Construction	0.05	0.12	0.04	0.10	0.12	-0.04	0.12*	0.10	0.10*	0.04	0.02	0.05
Business services	-0.05	-0.09*	-0.04	-0.06	0.03	0.02	-0.00	0.03	0.09**	0.09**	0.01	-0.01
20–49	-0.00	-0.07	0.02	-0.04	-0.03	0.09	0.02	0.05	0.03	0.07	0.05	0.01
50+ employees	-0.01	0.01	-0.00	0.01	-0.08	0.11	-0.01	0.10	-0.02	0.04	0.07	0.07
South-Western region	-0.04	0.14***	-0.08*	0.08*	-0.01	0.10*	0.01	0.08*	-0.03	0.02	-0.04	0.01
Negative demand shocks	0.04	-0.04	0.16**	0.05	0.06	0.22*	0.08	0.09	0.02	0.07	0.05	-0.48
Negative non-demand shocks	-0.02	0.03	0.11**	0.18***	0.02	0.28***	0.15***	0.15**	0.08**	0.11*	0.02	0.06
Negative demand and non-demand shocks	0.05	0.15	-0.09	0.06	0.06	-0.11	-0.07	-0.08	-0.02	-0.04	-0.00	0.52
High labour share	0.06**	-0.01	-0.02	-0.03	0.02	0.04	-0.03	-0.01	0.01	0.01	0.02	0.02
More bonuses in wage bill	-0.05	-0.07*	-0.04	-0.07	-0.03	-0.16***	0.04	-0.05	0.00	-0.05	-0.01	-0.01
Mostly low-skilled	-0.02	0.02	-0.04	-0.05	0.02	0.06	0.00	0.01	-0.01	-0.01	-0.03	-0.03
Mostly MW employees	-0.07*	-0.04	-0.08	-0.04	-0.05	0.06	-0.02	-0.01	0.08*	0.05	0.00	0.01
Mostly MSST employees	0.03	0.01	0.04	0.03	0.05	-0.01	-0.03	0.01	-0.05	-0.01	0.04	0.06*
Firm agreement	-0.03	-0.02	0.02	0.07	0.04	-0.08	0.05	0.05	0.05	0.02	0.00	0.01
Dependent price setting	-0.02	0.06	-0.02	0.07	-0.01	0.01	-0.00	0.00	0.00	0.04	0.01	-0.01
N	385	390	385	390	385	390	348	390	385	390	321	390
pseudo R-sq	0.332	0.223	0.309	0.175	0.190	0.203	0.243	0.138	0.213	0.116	0.326	0.144
chi2	44.18***	63.13***	69.67***	64.16***	39.16***	93.88***	47.33***	42.76***	38.24***	30.39**	31.25***	28.92**

Notes: (*), (**) and (***) denote statistical significance at 10, 5 and 1 percent, respectively.
The dependent variable in each of the columns is a dummy variable, taking the value 1, if the respective component is declining in the respective period and 0 otherwise. The reference category is a firm from the trade sector of size below 20 employees from other than the South-Western region of the country, relying mainly on domestic revenues, having experienced neither a negative demand, nor a non-demand shock ,with a lower labour share, less bonuses in the wage bill, not applying industry or firm-level agreement, employing mainly non-MW and MSST employees and following an independent price-setting rule.

Sources: WDN3 survey, authors' calculations.

Table 13: **Covariates of frequent (at least annual) wage and price changes, 2010–2013, multivariate probit estimates**

	(1)		(2)	
	Wage	Price	Wage	Price
Manufacturing	0.3	-0.3	0.1	-0.1
Construction	0.3	-0.2	-0.1	-0.3
Business services	-0.2	-0.4	-0.2	-0.3
20-49	-0.3	0.2	-0.2	0.2
50+ employees	0.1	-0.4	0.1	0.1
Multi-establishment	0.5	0.5		
South-Western region	-1.0***	-0.1	-1.1***	-0.3
Mainly foreign revenues	0.2	0.0		
Negative demand shocks	-0.0	0.2	0.0	0.4*
Negative non-demand shocks	0.1	0.4	0.1	0.3
High labour share	-0.1	0.0		
More bonuses in wage bill	0.2	-0.5*	0.2	-0.6**
Mostly low-skilled	-0.1	0.2		
Mostly MW employees	-0.6*	-0.4	-0.4*	-0.2
Mostly MSST employees	0.2	0.3		
Industry agreement	0.4	-4.7		
Firm agreement	-0.1	0.5		
Dependent price setting	-0.1	-0.4		
Observations		271		307
chi2		78.15***		75.35***

Notes: (*), (**) and (***) denote statistical significance at 10, 5 and 1 percent, respectively. Dependent variables take the value of 1 when the frequency was at least annual and 0 otherwise.

Sources: WDN3 survey, authors' calculations.

Table 14: **Covariates of frequent (at least annual) wage changes, prior to 2009, 2009 and 2010–2013 respectively, probit estimates, average marginal effects**

	(1)	(2)	(3)
	till 2009	2009	2010–2013
Manufacturing	0.02	0.01	0.02
Construction	0.25	0.26	0.12
Business services	-0.02	-0.02	-0.05
20-49	0.05	0.05	-0.11
50+ employees	0.01	0.01	0.01
Multi-establishment	0.13	0.11	0.10
South-Western region	-0.25***	-0.24***	-0.29***
Mainly foreign revenues	-0.06	-0.06	0.02
High labour share	0.00	-0.00	-0.02
More bonuses in wage bill	0.03	0.03	0.02
Mostly low-skilled	-0.06	-0.06	-0.02
Mostly MW employees	-0.08	-0.07	-0.19*
Mostly MSST employees	0.04	0.04	0.12
Industry agreement	0.15	0.14	0.13
Firm agreement	-0.26**	-0.26**	-0.06
Dependent price setting	-0.05	-0.05	-0.04
Negative demand shocks		0.20	-0.08
Negative non-demand shocks		0.00	0.06
Negative demand and non-demand shocks		-0.16	0.05
N	317	315	317
pseudo R-sq	0.104	0.108	0.114
chi2	45.72***	47.08***	49.00***

Note: (*), (**) and (***) denote statistical significance at 10, 5 and 1 percent, respectively.

Sources: WDN3 survey, authors' calculations.

Table 15: **Covariates of inflation indexation and high relevance of labour costs for price changes, 2009 and 2010–2013 respectively, probit estimates, average marginal effects**

	Wage indexation		Labour cost relevance
	2009	2010–2013	
Manufacturing	0.03	-0.00	0.12
Construction	0.04	0.16	0.11
Business services	-0.03	0.03	-0.07
20–49	0.06	0.03	-0.03
50+ employees	0.11	0.14	0.12
Multi-establishment	0.00	-0.06	0.03
South-Western region	-0.07	-0.03	0.22***
Mainly foreign revenues	-0.02	-0.10	-0.15*
Negative demand shocks	-0.16	-0.27*	-0.01
Negative non-demand shocks	-0.02	-0.08	0.01
Negative demand and non-demand shocks	0.13	0.23	0.01
High labour share	0.04	0.10*	-0.03
More bonuses in wage bill	0.12*	0.14**	0.04
Mostly low-skilled	-0.01	-0.01	-0.07
Mostly MW employees	-0.00	0.13	0.06
Mostly MSST employees	-0.08	-0.08	0.05
Industry agreement	0.19	-0.03	0.20
Firm agreement	-0.06	-0.08	-0.18*
Dependent price setting	-0.05	-0.16**	-0.01
N	374	379	380
pseudo R-sq	0.054	0.092	0.102
chi2	23.39	41.69***	44.87***

Notes: (*), (**) and (***) denote statistical significance at 10, 5 and 1 percent, respectively. In the case of inflation indexation the variable is equal to 1 if the firm was indexing wages to inflation. The self-reported relevance of labour costs for price changes equals 1 if firms indicated them to be very relevant and 0 otherwise. The reference category is a single-establishment firm from the trade sector of size below 20 employees from other than the South-Western region of the country, relying mainly on domestic revenues, having experienced neither a negative demand, nor a non-demand shock, with a lower labour share, less bonuses in the wage bill, not applying industry or firm-level agreement, employing mainly non-MW and MSST employees and following an independent price-setting rule.

Sources: WDN3 survey, authors' calculations.

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