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Wage adjustments for employees are a reaction mechanism to changing market conditions and form a significant part of pay policy. Though various attempts to explore wage levels and wage differentials have been made, wage adjustment policies remain an understudied topic. This paper analyses the determinants of wage adjustments based on data from Russian enterprises 2015–17. The analysis is based on detailed data from an employer survey which covers more than 5,000 firms in both the public and private sector. The study adopts probit models to identify the reasons which determine wage revisions, depending on internal employer characteristics and external labour market conditions.

The results are in line with previous research on the topic (Bayo-Moriones et al., 2016) and suggest that both internal and external factors influence wage adjustments. A wage adjustment is a reflection of the ability to pay meaning that revisions are often made by successful firms with high employee turnover. Institutional frameworks, especially trade union activity, affects the firm's decision to adjust wages despite the general opinion on the insignificance of unions in Russia. This study contributes to the limited literature by analysing the determinants of wage policies depending on the firm's characteristics. This is the first study of its kind based on extensive Russian data.

JEL Classification: D22, J01, J31, J33, J51

Keywords: Russia, wage adjustment, pay policy, pay settlement, trade union

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Introduction

Wages are a key indicator of the labour market and a significant element in employment relations. Set by the employer, wages instantly reflect the inner value of the employee's human capital and other personal characteristics. However, the process of wage setting is not that obvious as the characteristics of a firm are widely recognized as a reason for behaviour related differences (see Suleman et al., 2013; Sgobbi, 2015, among others). The firm's decision to adjust wages appears to be affected by a variety of internal and external factors, including the institutional framework of the particular labour market, current macroeconomic conditions, and the financial state of the firm.

We should clarify what we mean by wage adjustments in this paper. A wage adjustment is either an increase or a decrease in nominal base pay for an employee. A raise of performance pay does not count as an adjustment. Due to structural differences between enterprises, the necessity to adjust wages to market changes can be viewed in numerous ways. Moreover, enterprises prefer to avoid revisions if market conditions remain constant as wage reconsiderations have high transaction costs, including management time and additional spending on research.

The literature either focuses on HR practices and their impact on employee performance and well-being (Wang, 2017) or investigates wage adjustments in the context of downward nominal wage rigidity (Blanchflower, Oswald, 1988; Bewely, 1999; Babecký et al., 2010). There are a number of studies concerning the wage behaviour of firms from the macroeconomic point of view, as the problem of wage-setting is closely linked to unemployment, inflation and other macroeconomic issues. One of the most notable studies in terms of country coverage was done by the European Central Bank and the National Central Banks in the framework of Wage Dynamics Network (Cornille, 2015; Babecký et al., 2010; Kézdi, Kónya, 2011). The survey-based research examined the reaction of firms to economic shocks and elicited the wage setting practices used in European countries. However, there is very limited literature dedicated to the internal factors determining wage adjustments and the institutions which shape wage behaviour (Bayo-Moriones et al., 2016; Forth, Millward, 2000; Ingram et al., 1999).

Most of the literature is based on data obtained from European countries where labour market conditions differ from those in Russia significantly both in content and in context. Although there are academic papers dedicated to the wage determination process in Russian enterprises where data from a single enterprise is considered (Morrison, Swartz, 2003; Dohmen et al, 2007), we provide an analysis based on a large sample of enterprises functioning in current

market conditions. Due to strict formal labour regulations and relatively high firing costs, Russian enterprises have a fast adjustment mechanism expressed primarily in wages. Wages are split into two tiers: base pay and variable pay. Variable pay in Russia is relatively large compared to developed countries and could be as high as 30% of the overall remuneration (Gimpelson, Kapelushnikov, 2013). While base pay is specified in the contract and can be regulated with collective agreements, variable pay almost entirely depends on the employer's decision and, accordingly, the total compensation depends on the performance of the business. Cutting variable pay allows some flexibility even though the conditions of the external labour market may remain inflexible. Adjusting variable pay is most common, if short-term, change. Base pay is used for adjustment to long-term changes. Evidence suggests that nearly 2/3 of Russian firms adjust base pay with some frequency. Therefore, the research question of this paper is the following: what mechanisms force enterprises to revise the base pay? Our findings suggest that the wage adjustment mechanism of Russian enterprises is more complex than it is generally assumed to be.

This paper investigates the wage policies of Russian firms in terms of wage adjustments according to the characteristics of the employer. The study contributes to the existing literature in two main ways. First, our analysis concerns base pay while the majority of studies dedicated to the Russian labour market focuses on variable pay (Commander et al., 1996). As in previous research, we focus mostly on the adjustments that are systematically performed for individuals and for groups of employees, which is sometimes referred to in the literature as pay settlements (Bayo-Moriones et al., 2016; Ingram et al., 1999). Second, although the link between wage differentials and employer characteristics has been widely assessed by scholars (Werner, Ward, 2004), wage adjustment behaviour does not necessarily follow the same patterns.

The rest of the paper is organized as follows: Section 1 begins by reviewing the literature on wage adjustment and describes the features of the Russian labour market. Section 2 presents the data used for the study and explains the research methodology. Section 3 provides the results of the regression analysis and a discussion of the determinants of various wage adjustment policies. The last section concludes.

Literature review

The first empirical works concerning the wage policies of firms can be traced back to the 1980s (Knight, Sabot, 1983). Though human capital was perceived to be the main factor behind

wage differentials, attempts to distinguish the effect of employer characteristics on wages were already being made in early literature (see Groshen, 1991). More recent empirical studies concerning wage policies started re-appearing again in the 2000s, mostly as a result of the world financial crisis of 2008 which, apart from major layoffs, lead to real and nominal wage cuts in a number of countries. In particular, a great deal of attention was paid to wage adjustments as one of the core mechanisms to react to economic challenges. As labour costs form a significant part of the overall costs of any enterprise, by adjusting them in a timely manner, firms were able to become competitive and financially successful.

Enterprises usually avoid wage cuts even during severe economic shocks. This phenomenon has come to be known as downward nominal wage rigidity. Pay cuts are assumed to be undesirable as they could damage worker morale and the reputation of the firm, which could lead directly to difficulties when hiring new employees (Bewley, 1999; Galuscák et al., 2010; Kunovac, Pufnik, 2015). Wages are considered to play a motivational role for employees. Many studies have used interviews with managers in order to investigate their attitudes towards wage adjustments, including pay reductions. The results mainly revealed that fairness considerations are a core motivation in the labour market, hence, relative wages are important for wage adjustment decisions (Blinder, Choi, 1990; Blanchflower, Oswald, 1988; Agell, Bennmarker, 1995; Agell, Bennmarker, 2007). In the majority of cases the policy of pay cuts does not really pay off: a cut would save a few jobs but that is not equal to the advantages of layoffs (Bewley, 2007). Thus wages are rarely revised downwards. However, sometimes wages have no reaction to temporal shocks as the firm's adjustment to new market conditions occurs through non-labour expense cuts (Kézdi, Kónya, 2012).

Wage adjustments may occur for various internal and external reasons (Blanchflower, Oswald, 1988). In this paper, we assume that employer characteristics and the institutional framework determine the reaction of firms to any internal or external factors. We also pay attention to inflation as one of the external reasons for wage adjustments.

Employer characteristics

A great deal of the literature is dedicated to the characteristics that result in higher wages. Although this is not necessarily the same as frequent wage adjustments, we consider that in wage adjustment decisions several similar mechanisms and explanations can be applied. It has been widely acknowledged that the reward system adopted by the employer varies due to the inner

workings of the firm (see Groschen, 1991). In particular, productivity and financial success provide the employer with the ability to pay (Blanchflower, Oswald, 1988; Agel, Lundborg, 1995). Generating greater income allows the firm to allocate resources with relatively more freedom which, in general, can result both in a performance pay increase or a base pay increase. For non-union private firms, the market wage rate and the firm's profitability are the most important factors in wage adjustment decisions (Amirault, et al., 2013). Characteristics such as investment and innovation activity which can be expressed either by the implementation of new managerial practices or technological tools may increase the firm's productivity and consequently their profits.

Some studies are dedicated to the link between the size of the establishment and its wage policy as large firms usually pay higher wages and exercise wage posting to new employees meaning that the wage is defined in terms of duties and the employee's characteristics do not affect it (Brown, Medoff, 1989; Belfield, Wei, 2004). The standardization of usual practices leads to wage increases and a drop in transaction costs. Larger companies are presumed to be more sensitive to work disruptions, hence, the bargaining power of employees may be greater in larger companies in order to minimize the risk of strikes and other actions (Agell, Bennmarker, 2007). On the contrary, start-ups and small firms pay lower wages (Brixy et al., 2007).

Previous research has revealed the importance of the ownership of the firm. International corporations tend to operate under different institutional conditions, thus their pay policies reflect these differences. A smaller correlation between wages and the performance of the firm may be observed due to the broad geographical spread of the countries where they operate (Bayo-Moriones et al., 2016). Some scholars analysing transition economies discovered that firm ownership does not have a systematic effect on employment and wages, contrary to expectations (Basu et al., 2000).

Institutional framework

The correlation between institutions and labour market outcomes has been assessed in literature (Lehmann, Muravyev, 2012). The institutional framework plays an especially notable role in wage flexibility as it predetermines the reactions when enterprises experience economic challenges (see Ingram et al., 1999). Unions and collective agreements are institutional adjustment mechanisms which determine the possibility of wage bargaining and market rates. Strict institutional regulation is associated with the prevalence of external factors in the wage-

setting process, while weak institutions, in contrast, result in the predominance of internal factors (Bayo-Moriones et al., 2016).

Trade unions, as an essential part of the institutional framework, experienced a decrease in power in the majority of developed economies at the turn of this century. Still, unions exercise workplace strength in wage determination in spite of the efforts taken to reform the system and deregulate labour markets, which is assumed to improve their performance (Lehmann, Muraviev, 2012). Enterprises are supposed to change their wage adjustment patterns when there is deregulation, by switching their emphasis from external factors to internal. However, a study in Britain shows that this switch never occurred as inflation and comparability remained important (Ingram et al., 1999). Another important instrument is the national legal minimum wage. The minimum wage acts as the floor for the wage adjustment process. A low minimum wage leads to an increase in low-paid jobs. Despite the common agreement on productivity as the main factor influencing wages, the minimum wage together with other external factors may act as the main driver of wage increases (Agudelo, Sala, 2016).

Wages are also the result of collective bargaining, which depends on the distribution of bargaining powers between the employer and the employees of the particular enterprise. However, in countries with rigid institutions wage adjustment does not completely depend on the firm's decisions but on the decisions, taken jointly at the industry and national levels. Empirical studies show that in a post-crisis environment, enterprises, functioning in more centralized bargaining regimes have higher wages compared to those in a more decentralized setting (Ronchi, Mauro, 2017).

Finally, the quality of enforcement plays a core role in determining the further efficiency of labour market regulations. By introducing strict labour laws and a valid enforcement mechanism, firms become more rigid, which can have a negative effect on the firm's performance. Enforceable labour regulations are associated with lower growth rates in terms of the overall economic performance of the country both for developed and developing nations (Calderon et al., 2017).

Inflation

Inflation is a major driver for mass wage revisions. As a wage adjustment implies transaction costs associated with research on better practices, employers can be expected to adjust wages using the national inflation rate in order to drive these costs down. This is

especially relevant for large establishments where wage setting is usually limited to wage posting as a large number of employees makes a individual approach to wages impractical (Brown, Medoff, 1989; Iregui et al., 2013). In some institutional frameworks adjustments are linked to the cost of living, otherwise the living standards of employees would be at risk. Protecting these standards is one of the core reasons for wage adjustments (Bewley, 1999; Forth, Millward, 2000). However, empirical evidence suggests that changes in prices and wages are not necessarily directly synchronized (Druant et al., 2010) and differences between public and private sector adjustments are not recognized in literature.

Though inflation is an issue for any economy, formal indexation does not take place everywhere. In Canada only the minority of firms formally adjust wages due to the rising cost of living, although among managers inflation is considered to be one of the drivers of wage revisions (Amirault et al., 2013). In contrast, the institutional framework of Belgium requires automatic indexation for almost all establishments (Cornille, 2015). Overall, 17% of firms in Europe applie wage indexation mechanisms (Babecki et al., 2010). Some detailed information on the fraction of firms that carry out indexation in different countries is presented in Table 1.

Tab.1. The fraction of firms with formal wage indexation in European countries (%)

Austria	9,8	Hungary	11,2
Belgium	98,2	Ireland	9,5
Czech republic	11,7	Italy	1,7
Estonia	4,4	Lithuania	10,8
Spain	54,8	Poland	6,9
France	9,6	Portugal	9
Greece	20	Slovenia	23,5

Source: (Babecký et al., 2010)

Russian labour market specifics

The Russian labour market has features setting it apart from a range of developed countries. As discussed earlier, in developed economies employers are usually hesitant to cut wages, instead, they adjust labour costs by reducing the number of employees. The situation in Russia is different both in content and context. The institutional framework of the Russian labour market consists of institutions which regulate the quantitative adjustment of labour, and institutions which enable wage flexibility. Rigid labour legislation impedes employment volatility, while two-tier wages with a significant variable part, linked to the results of the

economic activity of the establishment, ensures labour cost adjustments (Commander et al., 1996; Gimpelson, Kapelushnikov, 2013). Flexibility in terms of adjusting to crises is underscored by high wage elasticity to employment (Vakulenko, Gurvich, 2016). The modern Russian model of the labour market, which first appeared during the transition period in the 1990s, proved to be valid during the 2008–9 recession, when a significant proportion of private enterprises introduced cuts and freezes in nominal wages (Gimpelson, Kapelushnikov, 2013).

Russia employs a complex bargaining structure which includes national-level agreements, industry-level tariff agreements between employers' associations and sector-specific trade unions, and regional-level agreements. As variable pay is not enshrined in the contract, it is not a subject to collective bargaining (Gimpelson, Kapelushnikov, 2013). In contrast to a range of developed countries, trade unions and collective agreement regulation, although present, are assumed to have an insignificant influence on the wage setting process with trade unions being controlled by the government (Lehmann, Muraviev, 2012). Wages are usually set through informal individual bargaining without union participation (Lukiyanova, 2011). However, collective agreements are intended to set the minimum wage level, while no institutional mechanisms for possible wage increases are recognized. Until recently in Russia the minimum wage was determined nationally. Regional differentiation was allowed by a system of regional coefficients. Due to substantial regional heterogeneity, most of the regional labour markets remain insensitive to this institution. After reforms were passed in 2016, a brand new system was implemented, which now combines federal- and regional-level participation. Although the legislative change lead to an increase in the earnings of low-paid workers, it did not result in greater variation in minimum wages. A relatively small proportion of Russian employees are exposed to minimum wage changes (Lukiyanova, Vishnevskaya, 2016).

A large part of the literature is dedicated to the transformation period of the 1990s and demonstrates how wage setting behaviour varied with the change of the economic system and the legal status of enterprises (Basu et al., 2000). At the beginning of the transition period, Russian firms were unresponsive in adjusting their employment to changes while other Eastern European countries, which were also subject to communist regimes in the past, started doing that faster. As a result of the shifts in the economic structure, brand new employer-employee relations appeared as firms acquired almost complete freedom in their wage setting and employment policies.

Method

Data and sample

For the research, we use the Interaction of Internal and External Labour Markets survey (IIELM), which has been carried out annually by the National Research University Higher School of Economics since 2009 and contains information on HR management techniques. Our sample consists of 5,058 enterprises from 25 regions[5] in the public and private sector and covers their activities 2015–17. The survey provides detailed information on aspects of their economic performance, including their financial position, wage revision policies and workforce. The non-panel sample is adjusted annually. The data was not intended to provide a panel with approximately 5% of the whole sample being panel data. Therefore, we employ pooled data and control for the year of observation in the analysis.

Enterprises differ in sectoral perspective as the differences in business processes leads to different types of workers being demanded. The core segment of the economy which many researchers focus on is manufacturing – an old sector with developed bargaining mechanisms (Bayo-Moriones et al., 2016; Ingram et al., 1999). However, we do not limit the study only to manufacturing enterprises; included in the sample are organizations operating in mining, construction, trade, finance, and business services. Manufacturing makes up 24,3% of the enterprises, followed by trade (21,9%) and services (14,7%). Mining enterprises are the least presented (6,2%).

The original sample provides extensive coverage of large and medium-sized firms. However, it might be biased towards larger organizations due to the absence of enterprises with less than 30 employees. The majority of enterprises belong to the private sector (92%) with only 2% of them being foreign-owned. Ownership is determined by the share of the enterprise currently in (a) private ownership (Russian and foreign) and (b) state ownership. State firms are defined as entities with more than 50% owned directly or indirectly by the state, while foreign firms are defined as entities more than 50% owned by either foreign companies or foreign individuals.

[5] The enterprises in the sample are distributed among regions in the following way: Bashkortostan (3,4%), Karelia (0,4%), Komi (0,9%), Tatarstan (5,4%), Altai krai (2,9%), Krasnodar krai (4,5%), Krasnoyarsk krai (4,2%), Primorsky krai (3,1%), Voronezh oblast (2,6%), Irkutsk oblast (3,9%), Kaliningrad oblast (1,9%), Kemerovo oblast (3,7%), Magadan oblast (0,04%), Novgorod oblast (4,1%), Novosibirsk oblast (4,6%), Orenburg oblast (0,9%), Perm Krai (2,5%), Rostov oblast (4,1%), Samara oblast (3,2%), Saratov oblast (1,3%), Sverdlovsk oblast (6,8%), Tyumen oblast (7,8%), Chelyabinsk oblast (3,6%), Moscow (12,4%), and Saint Petersburg (11,6%).

More than half the enterprises claim their financial position to be satisfactory (53,8%), 37,5% describe it as good, and the remaining 8,7% say it is bad. 41% of the enterprises had innovations implemented in the production process and 40% were invested in during the past year.

Participation in labour unions and the use of tariff wage schemes reflect the institutional framework of the labour market. In this paper we refer to tariff schemes as an institutional system which differentiates and regulates wages for particular groups of employees depending on the intensity and difficulty of the work performed, and the level of qualification of the employee. Although tariff schemes may reduce the costs of wage setting for enterprises, they increase the rigidity of wage adjustments reducing possibilities for swift reactions to external shocks. Tariff schemes are mostly used by the enterprises with a Soviet legacy and are mainly concentrated in manufacturing. Among recently established enterprises, tariff schemes are rarely favoured over more sophisticated HR grade systems which allow for more flexibility. Only 11% of the enterprises in the sample have any employees participating in labour unions, 43% of the sample use tariff schemes, with 24% taking them into consideration during the wage determination process. Union participation is mostly concentrated in mining (18,1%) and manufacturing (19,5%), in large and relatively large enterprises (42,5% for firms with 1000+ employees and 23,4% for firms 251–1000 employees, respectively).

Wage adjustment policies

Two questions in the survey are of particular interest for our study.

The first one "Does your firm revise the level of the base wage?" has 4 possible answers. Three of them mean that wage adjustments take place with some frequency: "Yes, wages are changed for everyone annually", "Yes, wages are changed for everyone occasionally", "Yes, wages are changed for some workers occasionally". The answer "No, wages are not revised" means that there is no observed specific pattern in wage adjustment and such adjustments have not been performed in the recent past. In order to provide clearer and more significant results, we merged the choices, leaving only two for further analysis – "Yes, wages are revised" (answers 1-3) and "No, wages are not revised". We do not know for sure whether the presence of revision necessarily refers to wage increases. However, due to the downward nominal wage rigidity discussed in the literature review we assume that the revisions of base pay mostly result in increases.

The second question is “What are the reasons for base pay revisions in your enterprise?” Only those firms which gave an affirmative answer to the first were asked the second question, as it explores the patterns of the wage changes more in depth. There are 7 possible reasons for wage revisions, featured in the question. Following Blanchflower and Oswald (1988) we consider the answer “due to the improvement of the firm’s financial situation” to represent internal factors, while the answers “due to inflation”, “due to changes in the regional average wage”, “due to changes in the average wage of close competitors”, “due to changes in the national average wage”, “due to changes in collective agreements with unions”, and “due to the increase of the national minimum wage” are external factors for wage adjustment. Respondents could select more than one reason. On average, 61,8% of firms employ wage adjustments.[6] The larger the enterprise, the higher the proportion of firms employing wage adjustments, 54,4% of small firms (less than 50 employees) and 77,8% of large firms (more than 1000 employees). The transport and communications sector has the largest proportion of enterprises changing wages (71,8%). On the contrary, in the Services sector the smallest proportion of firms do so (53,9%). There is no significant difference between firms with different financial situations. Table 2 provides more detailed data on the distribution of firms in the sample concerning their wage adjustment policy.

[6] In this research we used technique of weighted sampling, and weights were chosen on the basis of general population distribution of Russian companies , provided by Russian Federal State Statistics Service

Tab.2. Descriptive statistics on wage adjustment, % of firms

	Do not adjust wages	Adjust wages
Average	38.2	61.8
Firm size		
<50	45.6	54.4
50-100	34.3	65.7
101-250	30.9	69.1
251-1000	29.5	70.5
1000+	22.2	77.8
Industry		
Mining	42.8	57.2
Manufacturing	33.2	66.8
Construction	41.4	58.7
Trade	39.6	60.4
Transport and communication	28.2	71.8
Finance	42.6	57.4
Services	46.1	53.9
Financial position		
Good	37.5	62.5
Average	36.9	63.1
Bad	49.8	50.2
Union		
No	39.4	60.6
Yes	25.8	74.2
Labour costs in overall costs	35.8	33.9
Investment		
No	43.6	56.4
Yes	29.0	71.0
Innovation		
No	43.7	56.3
Yes	28.5	71.5
Tariff wage schemes usage		
Yes	33.6	66.4
No, but considered	34.7	65.3
No	45.1	54.9
Average wage level		
0-19999	41.9	58.1
20000-24999	35.5	64.5
25000-34999	41.1	58.9
35000+	24.7	75.3
Ownership		
State-owned	35.4	64.6
Foreign owned	25.9	74.1
Region		
Bashkortostan	68.38	31.62
Karelia	36.84	63.16
Komi	36.36	63.64
Tatarstan	30.04	69.96
Altai Krai	38.13	61.87
Krasnodar Krai	23.85	76.15

Krasnoyarsk krai	71.22	28.78
Primorsky krai	25.97	74.03
Voronezh oblast	30.30	69.70
Irkutsk oblast	25.38	74.62
Kaliningrad oblast	29.03	70.97
Kemerovo oblast	25.82	74.18
Magadan oblast	0.00	100.00
Nizhny Novgorod oblast	27.08	72.92
Orenburg oblast	30.63	69.37
Perm Krai	27.27	72.73
Rostov oblast	35.83	64.17
Samara oblast	51.79	48.21
Saratov oblast	33.95	66.05
Sverdlovsk oblast	45.45	54.55
Tyumen oblast	37.98	62.02
Chelyabinsk oblast	61.46	38.54
Moscow	55.68	44.32
Saint Petersburg	18.90	81.10

Methodology

The first aim of this analysis is to distinguish what characteristics motivate firms to employ wage adjustments. For this purpose, we use a binary outcome model (probit regression), where the dependent variable is 1 if the enterprise changes the wage for any type of employees, and 0 otherwise. We do not focus on the timing of wage adjustments, although previous research indicates the existence of a schedule in a number of countries (for example, Amirault et al., 2013).

The determinants for each enterprise includes several subgroups. The first subgroup is a set of variables which reflects the structural features of the enterprise, including size, ownership, financial position (good, satisfactory or bad; self-estimated), innovation implementation, investment, price competition (which reflects the dependence of the firm's prices on the prices of its close competitors), staff turnover, net growth of the number of employees, real average wage level in the enterprise, and share of labour costs in overall costs. Innovation and investment are considered for the previous year, partly reflecting the overall financial performance of the enterprise. Employee turnover is calculated as the sum of hire and fire ratios (including both layoffs and voluntary quits), while employee net growth is the difference between the number of hires and fires.

The second subset of variables includes institutional factors which are union participation and the usage of a tariff pay system. We expect that these two factors will have a positive effect

on the probability of wage adjustments of any kind. Previous research found a positive effect of the centralization of collective bargaining for the wage level (Plasman et al., 2007) and for wage adjustments (Bayo-Moriones et al., 2016).

The regression also contains control variables for the year of the observation, the industry of activity and the region where the enterprise is located, which is especially important due to the significant regional differentiation in Russia. The control variable for a real wage increase compared to the previous year, which is referred to in the rest of the paper as "wage growth", is included in several specifications as well.

The second aim is to reveal the main reasons behind wage changes, depending on the enterprise characteristics discussed above. For this purpose, we run probit regressions for each of the reasons given for wage change featured in the survey (inflation, change of regional average wage, change of competitors' average wage, change of the national average wage, improvement of the company's financial situation, change in collective agreements, increase of the minimum wage) with the same set of variables as in the first regression. This allows us to examine the relevance of firm characteristics for particular wage adjustment practices.

We recognize a possible selection bias if second set of "reason" regressions is run only on the subsample of enterprises who revised wages during the previous year. In order to deal with this problem, we consider the firms which have not introduced wage adjustments in the recent past as ones which do not recognize any of the proposed reasons significant enough to perform revisions. Hence, when running the set of "reason" regressions we also include these firms in the sample by assigning them 0 in place of the dependent variable instead of missing. However, the results from the whole sample, presented in the next section, do not differ substantially from the results obtained on the sub-sample of firms which adjusted wages last year, which means that the concern with selection bias was excessive.

In this analysis we use robust standard errors which are heteroscedasticity-consistent. Though we recognize the possibility of the reversed causality problem, in this particular research we do not focus on it. However, reversed causality could be detected when including the wage growth variable into the analysis as wage growth can either be the result or the cause of wage revisions. For this reason, we run two separate probit models to recognize the determinants of wage adjustment, one with the variable (Table 3, column 1) and one without (Table 3, column 2).

Findings

This section examines the effects of internal and external factors on the firm's decision to adjust wages. The findings of the regression analysis are presented in Table 3.

Tab.3. Determinants of wage adjustments: Marginal effects

	(1)	(2)
Number of employees (30-50)		
51-100	0.042*	0.054**
	(0.025)	(0.025)
101-250	0.093***	0.099***
	(0.026)	(0,027)
251-1000	0,129***	0.130***
	(0.028)	(0.028)
1000+	0.102*	0.104**
	(0.055)	(0.055)
Financial Position (satisfactory)		
good	-0.008	-0.001
	(0.020)	(0.020)
bad	-0.035	-0.053
	(0.035)	(0.035)
Investment	0.050**	0.052**
	(0.023)	(0.023)
Innovation	0.035	0.036
	(0.023)	(0.023)
State-owned firm	-0.041	-0.046
	(0.047)	(0.047)
Foreign-owned firm	0.174**	0.202**
	(0.066)	(0.070)
Price competition	-0.001	0.000
	(0.021)	(0.021)
Real average wage (< 20 000)		
20 000-25 000	0.021	0.030
	(0.029)	(0.029)
25 000-35 000	-0.005	-0.001
	(0.028)	(0.028)
>35 000	0.087***	0.108***
	(0.032)	(0.032)
Employees turnover	0.070**	0.051
	(0.035)	(0.035)
Employees net growth	-0.046	0.037
	(0.087)	(0.085)
Labour costs in overall costs	-0.002***	-0.002***
	(0.001)	(0.001)
Wage growth	0.463***	-
	(0.074)	-
Union	0.070**	0.064*
	(0.035)	(0.035)
Tariff wage schemes usage (No)		

Yes	0.052**	0.057**
	(0.023)	(0.023)
No, but considered	0.037	0.043*
	(0.024)	(0.024)
Industry	+	+
Year	+	+
Region	+	+
Pseudo R^2	0.194	0.179
N	2,266	2,299

Note: 1) *, **, *** Statistically significant at the 0.05, 0.01 and 0.001 levels, respectively; 2) Robust standard errors in parentheses; 3) Reference category in parentheses

We start off with employer characteristics. We find that the size of the enterprise matters as the probability of wage adjustment is increasing with the growth of the number of employees. The same result was found in (Bayo-Moriones, 2016) for Spanish manufacturing enterprises. The explanation here is linked to trade union activity. First, large firms are more likely to have employees participating in trade unions. Hence, they obtain more bargaining power in wage setting. Second, large enterprises are usually more common for industries where trade unions have a long-standing history, i.e. mining and manufacture. Our expectations concerning the importance of trade unions are also confirmed which will be described more in detail below.

On the contrary, the relationship with the financial position which could be assumed to be linear from the previous studies (Commander et al., 1996), here appears to be statistically insignificant. The same conclusion concerns innovation activities undertaken during the previous year. However, investment activity, which also describes the firm from the point of view of its financial well-being, shows statistically significant results, meaning that being invested in in the past year leads to a higher probability of pay revisions during the current year. This finding partially confirms our expectations. Investment activity is usually present in prosperous enterprises where expected profits will lead to investor benefits. All in all, large profits and a good financial condition does not imply wage adjustments, contrary to the ideas expressed in (Amirault et al., 2013). Enterprises with higher real average wages are more likely to participate in wage adjustment process. These findings show that wage adjustment policies are mostly relevant for successful enterprises with high average wages. In fact, upward wage adjustment for successful firms might be an element of corporate policy aimed at increasing worker morale (Bewley, 1999).

Regarding other structural characteristics, foreign owned firms operating in Russia are more likely to participate in wage adjustments. The coefficient for state owned firms is, in contrast, statistically insignificant which is in line with Forth and Millward (2000) who found no significant difference between private and public sector adjustments for Britain. Higher

employee turnover also is correlated with a higher probability of wage adjustment. This finding could be attributed to the necessity of attracting new employees.

Concerning the share of labour costs, those enterprises which depend heavily on labour and spend a major part of their income on wages and other labour related costs, are more likely to adjust wages as their overall financial success depends on it. However, our results suggest the opposite effect. An increasing fraction of labour costs in overall costs leads to a decline in the probability of wage adjustment by 0,2%. This estimate is statistically significant.

Regarding market conditions, we find that participation in trade unions is positively related to the probability of wage adjustment, which is unexpected concerning literature dedicated to Russian labour market specifics. Despite the insignificance of unions in wage-setting and the lack of independence described in literature (Gimpelson, Kapelushnikov, 2013), institutional factors appear to be positively correlated with the probability of wage adjustment. Surprisingly, the union influence is insignificant in the Spanish framework, where a major role in wage adjustments is attributed to collective agreements. Spain has a centralized bargaining system with multilevel bargaining. Bargaining coverage is higher than trade union membership with approximately 98% of establishments in manufacturing being covered by collective agreements (Bayo-Moriones et al., 2016).

Tab. 4. Descriptive statistics for adjustment reasons

Factor	**(1) Share of the overall sample**		**(2) Share of those who adjusted wages last year**	
	Mean	Std. Dev.	Mean	Std. Dev.
inflation	0.27	0.01	0.35	0.48
changes in the average regional wage	0.18	0.01	0.24	0.42
changes in the average competitors' wage	0.09	0.00	0.11	0.31
changes in the average national wage	0.08	0.00	0.10	0.29
financial condition improvement	0.23	0.01	0.30	0.46
changes in collective agreements	0.02	0.00	0.02	0.14
the increase of national minimum wage	0.14	0.01	0.18	0.38

We now turn to the regression analysis that deals with particular causes of wage revisions. Table 4 provides descriptive statistics for adjustment reasons as a fraction of the overall sample (1) and that of firms which adjusted wages at some point in the last year (2). According to the table, inflation and an improvement in the financial situation are the main drivers for wage adjustment. The importance of inflation was also found for Spanish and British manufacturing which was the prevailing factor despite the decentralization of the bargaining

regime in Britain (Bayo-Moriones et al., 2016; Ingram et al., 1999). Unlike in Spain, changes in collective agreements appear to be the least important external factor. In Russia this could be due to lower union coverage, and the degree of centralization which is higher in Spain. In the more decentralized framework of Britain (Forth, Millward, 2000) union representatives were often involved when positive wage adjustments were implemented.

Next, we consider the results regarding employer characteristics and market conditions. Table 5 reports the coefficients from the set of "reason" probit regressions. SME appear to pay less attention to inflation compared to enterprises with 250–1,000 employees. This could be due to the transaction costs associated with wage adjustments in larger establishments. By adjusting wages to the national cost of living, the employer tries to minimize those costs. The same result is obtained for Spain (Bayo-Moriones et al, 2016). Inflation is also a driver closely related to comparability (Forth, Millward, 2000). Changes in the average regional wage, the average national wage and the average competitors' wage reflect the importance of comparability for wage adjustment decisions. Previous research also indicates that managers are focused on external wage relativities as higher competitor wages are supposed to lower the effort of workers (Agell, Bennmarker, 2007). Regarding the size of the enterprise, the importance of regional wages linearly increases while there is no such effect concerning the competitors' wages or the national wage. Good financial results appear to be an especially important driver for medium-sized enterprises with 101–250 employees and large ones with over 1000 employees.

As far as the firm's profitability is concerned, employers who estimate their financial condition as bad are less likely to adjust wages due to inflation or regional wages. Investment and innovation activities which are related to the firm's performance provide statistically significant results when regional and competitor wages are concerned, meaning that higher investment activity is positively related to the comparability considerations in wage adjustment decisions. With respect to the average wage, high wage employers are more likely to react to inflation, competitors and an improvement in their financial position, but regional and national comparability does not affect them. Finally, the minimum wage adjustment, as expected, is not relevant for high-wage firms and high-wage employees as the increase in average wages leads to a reduction of the wage adjustment probability.

Foreign firms give less importance to regional and national wages. As mentioned in the literature review, foreign owned firms emphasize internal factors rather than external due to their multiple institutional frameworks and the market conditions they operate in. State ownership decreases the probability of adjustment to changes in competitors' wages.

The last employer characteristic included in the analysis is employee turnover. It reflects the fact that enterprises need to recruit and retain labour which is among the factors for pay revisions discussed in the literature (Ingram et al., 1999; Bayo-Moriones et al., 2016). Our results indicate that increasing worker turnover means there is a higher probability of wage adjustment due to comparability with regional and competitors' wages. As competitors usually have similar characteristics, they establish a demand for similar types of workers. By adjusting wages, a firm tries to avoid any further difficulties with recruitment. Comparability reflects a standard that an employer may choose to follow. Although turnover was not considered a structural employer characteristic in previous research, the percentage of workers with a degree was a variable included in the research with the same purpose (Bayo-Moriones et al, 2016). Inflation indexation, on the contrary, is more common among firms with lower turnover and a lower net growth of employees, which suggests that these firms are focused on their current staff.

Finally, we analyse institutional factors which cause firms to react to external changes. Trade union activity predictably results in a higher probability of wage adjustment due to changes in collective agreements, but more importantly, it leads to the expanded role of comparability as a driver for revision. In contrast, industry, local and national comparisons in Britain became more influential after deregulation (Ingram et al., 1999). Similarly, in Spain the results indicate that unions protect insiders more than outsiders, which means less attention is paid to attracting employees, diminishing the importance of comparability. Regarding inflation, unions do not play an important role as there is no binding collective agreements on inflation adjustment in Russia. In countries with centralized bargaining, the cost of living appears to be of major importance (Bayo-Moriones et al, 2016).

Another institutional factor, tariff schemes, is the only variable which is statistically significant for almost all drivers of wage adjustment. Adjustments for inflation, comparability and minimum wage are likely to occur if pay schemes are applied, while the improvement of the financial performance is the only internal driver showing the opposite pattern.

In general, our results point to the significant influence both from internal and external factors which are difficult to disentangle.

Tab.5. Determinants of wage adjustments due to internal and external drivers: Marginal effect

	(1) **Inflation**	st.d.	(2) **Regional Wage**	st.d.	(3) **Competitor's Wage**	st.d.	(4) **Country Wage**	st.d.	(5) **Good Fin. Results**	st.d.	(6) **Col. Agreement**	st.d.	(7) **Minimum Wage**	st.d.
Number of employees (30-50)														
51-100	0.042*	(0.025)	0.051**	(0.021)	0.003	(0.018)	0.004	(0.015	0.052**	(0.024	0.014	(0.011)	0.043**	(0.019
101-250	0.034	(0.026)	0.071***	(0.023)	0.015	(0.019)	0.018	(0.017	0.091***	(0.027	0.002	(0.011)	0.008	(0.019
251-1000	0.086***	(0.030)	0.081***	(0.026)	0.032	(0.021)	0.027	(0.019	0.067**	(0.029	0.001	(0.011)	-0.019	(0.020
1000+	0.066	(0.052)	0.130***	(0.050)	0.062	(0.042)	0.034	(0.035	0.109**	(0.053	0.034	(0.026)	0.028	(0.039
Industry (Mining)														
Manufacture	-0.000	(0.045)	0.028	(0.037)	0.013	(0.031)	0.041*	(0.022)	0.003	(0.042)	-0.062*	(0.035)	-0.013	(0.031)
Construction	-0.048	(0.048)	0.050	(0.040)	0.034	(0.034)	0.068**	(0.027)	0.013	(0.045)	-0.075**	(0.035)	0.038	(0.036)
Trade	-0.004	(0.046)	0.031	(0.038)	0.001	(0.031)	0.038	(0.023)	0.036	(0.043)	-0.061*	(0.035)	0.000	(0.032)
Transport & Communications	-0.008	(0.050)	0.060	(0.043)	0.046	(0.037)	0.025	(0.026)	0.059	(0.049)	-0.083**	(0.035)	0.059	(0.039)
Finance	-0.028	(0.050)	0.038	(0.043)	0.067*	(0.037)	0.054*	(0.028)	0.019	(0.048)	-0.066*	(0.037)	-0.037	(0.035)
Services	-0.035	(0.048)	0.004	(0.040)	-0.013	(0.033)	0.049*	(0.026)	0.042	(0.046)	-0.072**	(0.036)	-0.025	(0.034)
Bad financial position	-0.117***	(0.032)	-0.065**	(0.029)	0.037	(0.032)	-0.033	(0.022)	-0.011	(0.035)	0.005	(0.018)	-0.023	(0.024)
Investment	0.027	(0.023)	0.036*	(0.020)	0.028*	(0.017)	0.020	(0.015)	0.017	(0.023)	-0.002	(0.010)	-0.008	(0.017)
Innovation	0.035	(0.023)	-0.000	(0.021)	-0.001	(0.017)	-0.014	(0.015)	0.006	(0.023)	0.001	(0.010)	0.019	(0.017)
State-owned firm	0.020	(0.043)	-0.043	(0.039)	-0.116***	(0.042)	-0.043	(0.029)	-0.066	(0.046)	0.015	(0.012)	-0.002	(0.031)
Foreign-owned firm	0.067	(0.061)	-0.117*	(0.062)	-0.029	(0.045)	-0.150**	(0.071)	0.098	(0.059)	-	-	0.031	(0.044)
Real average wage (< 20 000)														
20 000 – 25 000	0.072**	(0.029)	-0.014	(0.028)	0.035*	(0.020)	-0.023	(0.021)	0.052*	(0.027)	-0.007	(0.015)	-0.031	(0.023)
25 000 – 35 000	-0.007	(0.026)	-0.068***	(0.025)	0.038**	(0.019)	-0.020	(0.021)	0.101***	(0.026)	-0.014	(0.014)	-0.046**	(0.022)
> 35 000	0.132***	(0.034)	0.002	(0.032)	0.072***	(0.024)	-0.020	(0.024)	0.105***	(0.032)	-0.013	(0.016)	-0.066***	(0.025)
Worker turnover	-0.077**	(0.037)	0.118***	(0.030	0.068***	(0.025)	-0.020	(0.024)	0.013	(0.036)	0.011	(0.014)	0.032	(0.025)
Worker net growth	-0.232***	(0.088)	0.012	(0.074)	0.091	(0.059)	0.019	(0.057)	-0.022	(0.084)	0.027	(0.033)	-0.001	(0.062)

Labour costs in overall costs	-0.000	(0.001)	-0.001	(0.001)	-0.001	(0.000)	-0.001*	(0.000	-0.001*	(0.001	-0.000	(0.000)	-0.001*	(0.000)
Price competition	-0.000	(0.021)	-0.007	(0.018)	0.039**	(0.016)	-0.014	(0.013)	0.040*	(0.021)	-0.014*	(0.008)	-0.042***	(0.015)
Union	0.006	(0.031)	-0.043	(0.027)	0.066***	(0.021)	0.069***	(0.017)	0.065**	(0.030)	0.044***	(0.009)	0.022	(0.022)
Tariff wage schemes (No)														
Yes	0.108***	(0.023)	0.091***	(0.020)	0.018	(0.016)	0.038***	(0.014)	-0.048**	(0.023)	-0.001	(0.010)	0.047***	(0.017)
No, but considered	0.051**	(0.023)	0.064***	(0.020)	0.054***	(0.017)	0.029**	(0.014)	-0.046**	(0.023)	-0.018*	(0.009)	0.004	(0.016)
Wage growth	0.394***	(0.076)	0.091	(0.066)	0.029	(0.055)	0.152***	(0.050)	0.234***	(0.072)	0.059*	(0.030)	0.129**	(0.055)
year	+		+		+		+		+		+		+	
region	+		+		+		+		+		+		+	
Pseudo R^2	0.117		0.115		0.143		0.130		0.110		0.350		0.106	
Observations	2 268		2 268		2 141		2 229		2 268		1 581		2 262	

Note: 1) *, **, *** Statistically significant at the 0.05, 0.01 and 0.001 levels, respectively; 2) Robust standard errors in parentheses; 3) Reference category in parentheses

Conclusion

This study used data on Russian firms 2015–17 to investigate the determinants of wage adjustment decisions. We included seven internal and external drivers for pay revisions into the analysis to find out how employer characteristics and institutions influence wage adjustments. Inflation, changes in the average regional wage, changes in the average competitors' wage, changes in the average national wage, improvement in the financial situation, changes in collective agreements with unions and an increase of the national minimum wage were the factors considered in this research. We grouped the explanatory variables into two subsets: the structural features of the firms and institutional circumstances. Our analysis included sixteen independent variables. Only a few were significant for wage adjustment decisions.

Regarding the first set of variables, size, investment and employee turnover were positively related with the probability of wage adjustments. On the contrary, the financial situation or innovation activity do not tend to be statistically significant under any conditions. Ownership appeared to be significant when it comes to foreign-owned firms. In respect to the second set of variables, we found that union participation affects the weight attributed to particular wage adjustment drivers. Our results indicate that the presence of a trade union ensures that comparability plays a more notable role in wage adjustment.

Overall, our results suggest that revisions of base pay are mostly common for successful enterprises which offer higher wages and hire more employees. Wage adjustment is a mechanism for those who have the ability to pay. The institutional framework expressed in trade union participation and tariff pay schemes, though significant, leaves Russian firms room to manoeuvre as employers review and adjust base pay despite the flexibility introduced by variable pay in the Russian labour market.

This paper adds to the existing literature in several ways. First, it considers the Russian market which in comparison with Europe remains understudied in terms of enterprise wage policies. Second, it takes into consideration employer characteristics to describe wage setting policies. In this paper based on Russian data we have shown that pay reviews have a number of features that reflect important facets of employer behaviour in the labour market.

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