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# Wage and price setting behaviour of Lithuanian firms: survey-based evidence for 2008–2009 and 2010–2013\*

Jurgita Pesliakaitė\*\* and Tomas Šiaudvytis\*\*

## Abstract

This paper gives a broad descriptive overview on wage and price setting behaviour of Lithuanian firms during the last episode of the economic crisis in 2008–2009 and in the post-crisis period of 2010–2013. The evidence provided in this paper is based on the firm-level data from the third wave of the Wage Dynamic Network (WDN3) survey — the joint research project of the European Union (EU) countries launched within the European System of Central Banks (ESCB). Wage and price setting strategies of Lithuanian firms were evaluated by relating firms' decision-making to the macroeconomic, financial and institutional environment under which the firms are operating. The preliminary conclusion drawn in this paper is that both wages and prices show rather high degree of flexibility in Lithuania. Low wage rigidity should primarily be attributable to labour market institutions — low collective wage bargaining coverage and completely decentralised wage setting process. Easing of employment protection laws during the last episode of economic downturn might also have contributed to the increased wage flexibility in the after-crisis period.

*Keywords:* WDN survey; labour market; wage setting behaviour; price setting behaviour; Lithuania

\* This paper is not a research paper; it is the ESCB WDN3 project report for Lithuania.

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Any errors that remain are our sole responsibility.

## 1. Introduction

In 2006, the European System of Central Banks (ESCB) launched a Wage Dynamic Network (WDN) project with the aim to deeper understand features and sources of wage and labour costs dynamics in the European Union (EU) member states. Based on micro-data evidence collected for the EU firms, it was intended to better understand cost adjustments, to relate these to price setting behaviour and thereby to give direct signals for monetary policy-making decisions. The first wave of the WDN survey (WDN1) was conducted in 2007, the second one (WDN2) — in 2009 and the third wave of the WDN survey (WDN3) was launched in 2013 with the non-core and core reference periods of 2008–2009 and 2010–2013 respectively.

The main objective of this paper is to present comprehensive descriptive firm-level results from the third wave of the survey, WDN3, for Lithuania. This objective is achieved by tabulating data for the economy as an aggregate, for different firm size bins and for different sectors of the economy. Two separate periods are investigated — the last episode of the economic crisis in 2008–2009 and the recovery period of 2010–2013. It is evaluated how a variety of external macroeconomic and financial shocks affected the activity of the firms during these periods. The pre-determined shocks considered by the WDN3 survey were associated with changes in demand, volatility of demand, access to external financing, customers' ability to pay and availability of supplies. It was also investigated how Lithuanian firms succeeded to cope with these shocks — either by adjusting labour costs or seeking other non-labour cost adjustment strategies. The choice of the firms could possibly depend on the direction, sources and size of the shocks. The main labour cost adjustment channels — change in labour force or wage adjustment — were also identified if the firms engaged in such cost-change decisions. The role of labour market institutions on the incidences of these adjustments was evaluated as well. Not the least, in search for common patterns, the price-setting behaviour of Lithuanian firms was related to the cost-adjustment decisions.

This paper also provides information on the overall macroeconomic, financial and institutional environment in which Lithuanian firms were operating in the reference periods. Labour market institutions that could affect wage and price-setting behaviour of the firms are presented, underlying their expected impact on the decisions of the firms. In this paper causes of divergences across sectors and across different sizes of firms, if such were present, are also analysed. A special chapter is devoted to the effect of the minimum wage increase on labour market variables. As Lithuania was involved in the first wave of the project (WDN1), comparison of the most interesting results between the WDN3 and the WDN1 surveys is also provided here.

This paper is descriptive, covers a broad range of topics and is organised as follows. Sections 2 and 3 focus on some aspects of the WDN3 questionnaire and presents an economic outlook under which Lithuanian firms were operating in the reference periods. Sections 4–10 are devoted to reporting of the survey results. Section 4 provides firm-level results on the effect of external shocks on activity of Lithuanian firms. Section 5 focuses on labour force, whereas Section 6 — on wage adjustment strategies of the firms. Price-setting behaviour and the effect of the minimum wage increase on prices and labour market variables are addressed in Sections 7 and 8 respectively. To this end, a comparison of the results from different waves of surveys — WDN1 and WDN3 — is provided in Section 9. Section 10 summarises the results and concludes.

## 2. Design of the WDN3 survey: its features and sample composition in Lithuania

The harmonised WDN3 questionnaire was collectively designed by the participating countries in the WDN survey group in the ESCB system. As the aim of this project was primarily to deeper understand features and sources of wage and labour costs dynamics, the survey was designed to capture these particularities. The survey consisted of four core and two non-core blocks, in particular, the core blocks on *Information about the firm*, *Changes in the economic environment*, *Labour force adjustments* and *Wage adjustments* and non-core blocks on *Price setting and price changes* and *Minimum wage increase*. The majority of the questions in the WDN3 survey were split into a core period of 2010–2013 and a non-core period of 2008–2009. In addition, within the core blocks additional non-core questions could be asked in order to enrich information on wage or price-setting behaviour of firms.

The Lithuanian version of the WDN3 survey considered the non-core blocks on *Price setting and price changes* and *Minimum wage increase*; also, the non-core period of 2008–2009 was added to the questionnaire in order to get extra information on behaviour of the firms during economic crisis. No other country-specific questions were included. In

several cases the pre-agreed questions in the core and the non-core blocks were slightly modified in order to capture country-specific features. In many cases, however, the questions were left unchanged in order to make data comparable across participating countries in the WDN3 project.

The Bank of Lithuania outsourced the WDN3 survey fieldwork to an external enterprise *BERENT Research Baltic*, which released the pilot version of the survey in July–August 2014 and the main questionnaire in October–December 2014. The response rate to the main questionnaire was around 6 per cent. For the main questionnaire the targeted sample population of Lithuanian firms was chosen from the Lithuanian Business Registry, though, restricting the sample to the companies having at least five employees and operating in sectors of economy such as manufacturing (C), construction (F), trade (G), business services (H, I, J, L, M, N) and financial intermediation (K) in accordance to NACE2 definition.<sup>1</sup> The sampling strategy was chosen to ensure better coverage of population, thereby, stratifying it within two dimensions, in particular by sector, in accordance to NACE2, and by firm size. By sectors, stratification, as already mentioned, was based on five sector groups: manufacturing, construction, trade, business services and financial intermediation; by firm size — on four firm size categories: small firms (5–19 employees), medium size firms (20–49 employees), large firms (50–199 employees) and very large firms (over 200 employees). The realised sample in Lithuania covered 515 firms. The composition of the realised sample and population is presented in Table 1 with two separate panels devoted to provide information about the structure of the whole population of the firms in economy and the realised sample for Lithuania.

Table 1. Sample composition by sector and firm size

Shares in realised sample

Total: 515			Size by No of employees								Total	Total
			Small (5–19)		Medium (20–49)		Large (50–199)		Very large (200+)			
			No	%	No	%	No	%	No	%	No	%
Sector	C	Manufacturing	19	3.7	20	3.9	28	5.4	9	1.7	76	14.8
	D,E	Electricity, gas, water										
	F	Construction	30	5.8	13	2.5	14	2.7	3	0.6	60	11.7
	G	Trade	117	22.7	23	4.5	25	4.9	4	0.8	169	32.8
	H, I, J, L, M, N	Business services	93	18.1	34	6.6	20	3.9	6	1.2	153	29.7
	K	Financial intermediation	38	7.4	8	1.6	6	1.2	5	1.0	57	11.1
	O, P, Q	Non-market services										
<b>Total</b>			<b>297</b>	<b>57.7</b>	<b>98</b>	<b>19.0</b>	<b>93</b>	<b>18.1</b>	<b>27</b>	<b>5.2</b>	<b>515</b>	<b>100.0</b>

Shares in population

Total: 26451			Size by No of employees								Total	Total
			Small (5–19)		Medium (20–49)		Large (50–199)		Very large (200+)			
			No	%	No	%	No	%	No	%	No	%
Sector	C	Manufacturing	2,538	9.6	929	3.5	646	2.4	163	0.6	4,276	16.2
	D,E	Electricity, gas, water										
	F	Construction	2,360	8.9	621	2.3	285	1.1	47	0.2	3,313	12.5
	G	Trade	7,139	27.0	1,107	4.2	402	1.5	72	0.3	8,720	33.0
	H, I, J, L, M, N	Business services	7,803	29.5	1,356	5.1	569	2.2	111	0.4	9,839	37.2
	K	Financial intermediation	226	0.9	42	0.2	20	0.1	15	0.1	303	1.1
	O, P, Q	Non-market services										
<b>Total</b>			<b>20,066</b>	<b>75.9</b>	<b>4,055</b>	<b>15.3</b>	<b>1,922</b>	<b>7.3</b>	<b>408</b>	<b>1.5</b>	<b>26,451</b>	<b>100.0</b>

Sources: Shares in population are calculated from the Lithuanian Business Registry, Statistics Lithuania.

A comparison of calculated shares in the realised sample to their respective shares in population shows that the Lithuanian sample was over-represented by the firms in the sector of financial intermediation, but under-represented by business services. The shares of other sectors in the sample are similar to the ones in the population. Considering different sizes of firms, small firms were considerably under-sampled, especially against over-sampling of large firms. Divergences across sectors were also bigger where there was considerable under-sampling of small firms. Therefore, analysing sample data, firm– alternatively, employment– weights were used to correct for these divergences. If sample properties diverge from the properties of the population, unweighted statistics might be misleading to represent the

<sup>1</sup> More precisely, sector C stands for manufacturing, F — for construction, G — for wholesale and retail trade; repair of motor vehicles and motorcycles, H — for transportation and storage, I — for accommodation and food service activities; J — for information and communication, L — for real estate activities, M — for professional, scientific and technical activities, N — for administrative and support service activities and K — for financial and insurance activities in accordance to NACE2 definition. Public sector — O, P, Q — activities were excluded from analysis; also activities belonging to sectors D and E — electricity, gas, steam and air conditioning supply and water supply; sewage, waste management and remediation — were not considered in the sample due to the relatively small share of these sectors in the population.

population of the firms. The use of such weights is important for making the sample data representative of population. Both types of weighed samples (i.e. firm and employment weighted) are, however, very similar in their structure, so firm-weighted averages (except for minimum wage coverage) were largely chosen to be applied in tabulating results for Lithuania.

### 3. Macroeconomic outlook of Lithuania during 2008–2009 and 2010–2013

On the background of the general features of the WDN3 survey and sample composition in Lithuania, some facts about the overall macroeconomic conditions are further underlined. The emphasis is laid on such macroeconomic and financial indicators, that could be most important in assessing the evolution of labour market variables in the periods covered by the WDN3 survey: the crisis of 2008–2009 and the period of economic recovery in 2010–2013. Short overview of general macroeconomic conditions in these periods also allows to better understand the main results of the paper.

After the period of overheating, driven by the boost in credit growth and pro-cyclical fiscal policy, the Lithuanian economy experienced a phase of economic downturn with its start in the second half of 2008. Substantial contraction in the real GDP (dropped by over 15% in 2009) was followed by reduction in the number of employed and a significant increase in the unemployment rate (see Fig.2 and 3). Negative real GDP growth was recorded in all the sectors of economy — manufacturing, construction and services, although the sources of the adverse shocks differed significantly. Manufacturing, the most export-oriented sector, experienced contraction in external demand, which was a result of the global financial crisis. Domestically oriented sectors, such as services (especially trade, accommodation services, etc.) and construction, suffered mainly from negative shocks of domestic origin. Construction, the most cycle sensitive sector in the economy, was hit by the downturn the most — this sector recoded a much sharper decline in output, as compared to the other sectors. The number of employed decreased in all the sectors, especially in construction and manufacturing, although a considerable decline in nominal wage growth rate (up to 10% in the second half of 2009) was also observed in this period (see Fig.4 and 5). Contraction in credit supply in 2008–2009 was prompted by the Scandinavian banks, which, in the period before 2008, provided the large capital injections into (among others) economic activities.

The period of 2010–2013 was denoted by the gradual economic recovery in Lithuania. The economic conditions started to improve already in 2010, when small, but positive, real growth in GDP was mainly driven by export-oriented industries. Increase in external demand drove gradual pick-up in manufacturing activities. However, recovery in domestic demand lagged behind; the most notable recovery started in the remaining sectors only in 2011. In 2012–2013 all the sectors in the economy exhibited relatively slow, but steady growth in their output. Improvement in labour market performance lagged behind, the year of 2010 was marked by a historically high unemployment rate (around 18%) and the jobless recovery. Gradual increase in the number of employed and rather slow decline in unemployment started only in 2011 when labour intense production sectors in economy (i.e. construction and especially services) exhibited longer-lasting recovery patterns in their economic performance. Positive and steady nominal wage growth was recorded from 2011 along with overall improvement in the economic environment. By 2014, real GDP exceeded the pre-crisis level in manufacturing and the majority of service activities, but construction has shown the weakest after-crisis recovery — real value added in this sector was lower by approximately 30 per cent, compared to the pre-crisis level. Improvement in economic conditions led

Fig.2. Real GDP growth and contributions (production approach)

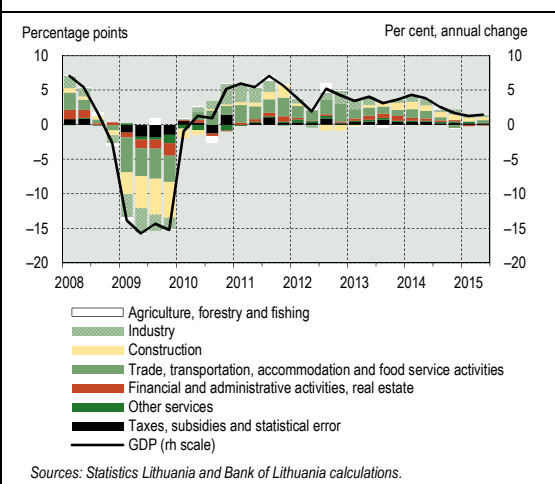
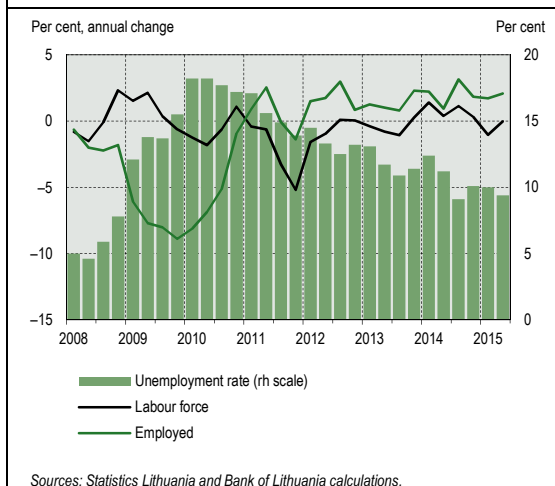
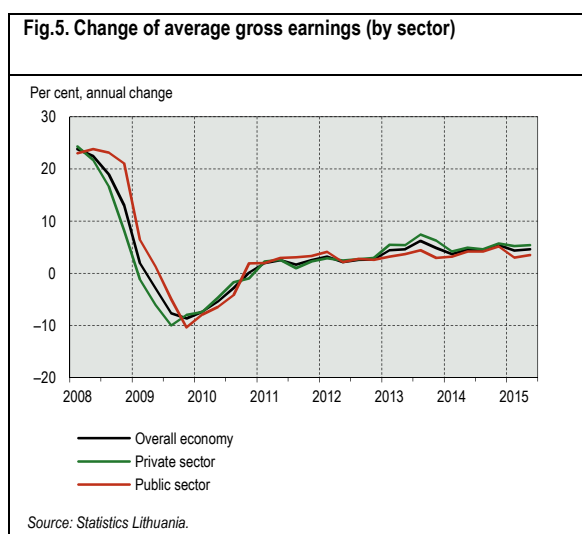
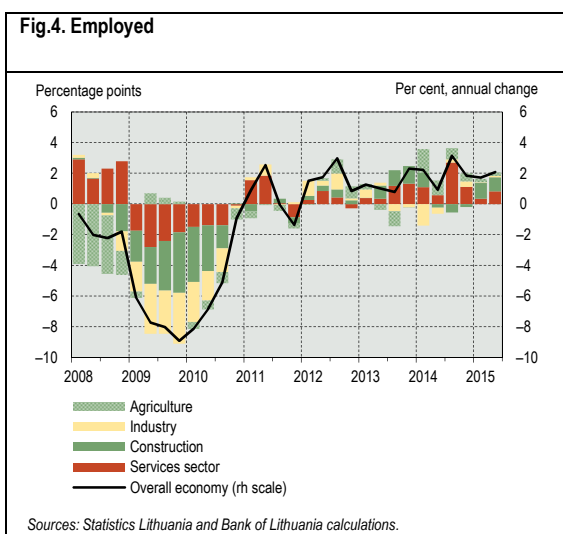


Fig.3. Development of labour market



to enhanced, but slow growth in credits. These trends are, to a high extent, captured by the firm-level data from the Lithuanian version of the WDN3 survey; results along with additional information are presented in Sections 4–9.



#### 4. WDN3 survey: changes in the economic environment

The WDN3 survey investigated primarily the perception of the Lithuanian firms about the overall economic conditions in 2008–2009 and 2010–2013. More specifically, the survey aimed to analyse the effect of some external shocks on the activity of firms. General features and intensities of these shocks were assumed to be essential for firm-level labour force and wage adjustment decisions which could also be directly linked to price-setting behaviour of Lithuanian firms.

The survey considered five types of pre-determined shocks: several of these might be straightforward, related to demand and a few to supply side shocks. Demand shocks were designed to extract information about the changes in activity of the firms occurring due to external changes in level of demand for firms' products and services as well as shifts in volatility of the demand. Supply side shocks were not directly linked to the cost-push up factors, but rather to changes in availability of external financing and availability of supplies. The last shock considered by the survey was related to the changes in customers' ability to pay. The firms were asked to assess the impact of these shocks on their activity by evaluating their direction (i.e. positive, negative or none) and intensity (i.e. strong or moderate) in 2008–2009 and 2010–2013 (sub-section 4.1). Firms were also asked to assess durability of all these shocks. In particular, it was investigated if these shocks explicitly were evaluated by the firms to be short or longer-lasting. Three exact alternatives were given for the answers — each of the shocks was considered to be either transitory or partially persistent or persistent. Only those firms that were affected by the shocks, however, were expected to give the answers concerning their persistency (sub-section 4.2). This information could be useful investigating whether cost adjustment strategies of the firms vary under different perceptions about the duration of the shocks. Access to finance was also studied more extensively by the WDN3 survey — financing conditions might likewise influence behaviour of the firms in cost adjustment decisions (sub-section 4.3). Evolution of total and labour costs along with their components was considered to be a very important part of the WDN3 survey (sub-sections 4.4–4.5). Trends in cost-development under different types and intensities of pre-determined external shocks allow making preliminary conclusions about the flexibility of the labour market. The relationship between economic conditions and trends in cost-development allows seeing whether Lithuanian firms could flexibly adjust their costs in the presence of external shocks or some other non-cost adjustment decisions should be taken to cope with changes in the economic environment (sub-section 4.6).

##### 4.1 The impact of the shocks on firms' activity

As mentioned above, the WDN3 survey aimed to gather firm-level information about the effect of a set of external shocks on activity of Lithuanian firms. These shocks were pre-determined by the survey and included changes in the level of demand for product and services, changes in volatility/uncertainty of demand, changes in the access to external financing through the usual financial channels, changes in customers' ability to pay and meet contractual terms as well as changes in the availability of supplies from the usual suppliers. Both positive and negative directions of these shocks

were listed among the possible answers along with the alternative to mark the option of no effect at all. The magnitude of the shocks was also investigated: firms were offered to evaluate whether these shocks have affected their activity strongly or moderately. Selected firm-level results depending on their relative importance for Lithuanian firms are listed in Table 6; its extended composition could be found in Tables A1a–A1e of Appendix A.

In accordance to the firm-level data, negative demand shock was among the most important ones that had an effect on activity of Lithuanian firms in 2008–2009. More than a half of the firms (almost 60%) reported that they were negatively (both strongly and moderately) affected by adversity of this shock. The share of the firms reporting the same direction of the shock was sizable, but considerably lower in 2010–2013 (above 25%), the period of gradual economic recovery. This period was also characterised by a relatively high share of the firms (almost 42%) reporting a positive effect of demand shock as compared to a relatively low fraction (around 12%) of such firms in 2008–2009.

As regards divergences across different firm sizes and sectors, these exist, but the direction and general pattern of the shock is relatively alike when firms in different groupings are considered. The adversity of demand shock in the period of 2008–2009 was most notable for the firms operating in the construction sector as well as in trade (over 60%). Such tendencies are very much supported by official statistics stating that these two sectors suffered the most from economic contraction with its start in the second half of 2008 (see Section 3). The magnitude of the demand shock tends also to be highly correlated to the size of the firms, in particular, a higher share of large and very large firms (over 60%) were exposed to the adversity of this shock. A high share (over 50%) of the firms operating in export oriented industries — in manufacturing — also reported a high exposure to the negative demand shock in 2008–2009, although it should be more related to external, not domestic, factors.<sup>2</sup> As opposed to the period of 2008–2009, in 2010–2013 relatively similar impact of the demand shock across different sizes of firms and across sectors was recorded for Lithuanian firms.

Table 6. The effect of the shocks on firms' activity; percentage of firms

	2008–2009									
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
<b>STRONG OR MODERATE DECREASE</b>										
In level of demand	57.9	57.6	55.7	61.7	75.4	55.7	67.9	61.2	53.8	52.6
In volatility/uncertainty of demand	48.1	47.3	47.5	52.7	65.6	43.3	66.8	53.1	41.4	52.1
In access to external financing through the usual financing channels	28.6	30.0	24.0	23.5	40.2	23.4	32.8	26.8	31.6	16.9
In customers' ability to pay and meet contractual conditions	52.9	53.2	52.2	51.0	55.7	45.8	66.5	57.6	48.9	49.8
In availability of supplies from the usual suppliers	20.6	21.5	15.9	19.3	39.4	11.6	21.8	31.5	15.2	6.1
<b>STRONG OR MODERATE INCREASE</b>										
In level of demand	12.3	12.6	13.0	9.1	10.7	11.3	12.9	11.9	13.1	10.8
In volatility/uncertainty of demand	11.8	11.8	13.1	10.4	9.0	9.3	16.8	10.3	13.1	11.7
In access to external financing through the usual financing channels	4.8	4.8	3.4	8.6	0.0	5.6	3.6	3.7	5.8	0.0
In customers' ability to pay and meet contractual conditions	6.3	5.8	8.3	6.8	4.9	5.6	3.6	6.0	7.7	4.7
In availability of supplies from the usual suppliers	6.8	7.0	6.8	5.9	4.9	5.0	11.8	8.2	5.4	2.4
	2010–2013									
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
<b>STRONG OR MODERATE DECREASE</b>										
In level of demand	25.9	27.1	22.1	21.5	26.9	27.7	28.8	21.5	28.0	27.0
In volatility/uncertainty of demand	22.1	22.9	18.9	18.0	31.4	27.2	19.1	18.9	23.5	29.7
In access to external financing through the usual financing channels	19.3	21.7	13.0	7.8	17.2	23.5	24.0	13.2	21.4	13.3
In customers' ability to pay and meet contractual conditions	32.5	35.0	26.2	20.8	26.1	28.2	41.7	30.6	33.0	32.7
In availability of supplies from the usual suppliers	12.9	13.8	10.3	7.2	17.2	13.1	7.5	16.6	11.5	1.9
<b>STRONG OR MODERATE INCREASE</b>										
In level of demand	41.6	39.1	50.1	48.4	45.5	42.9	44.7	45.3	36.7	38.0
In volatility/uncertainty of demand	37.8	35.1	46.8	45.5	44.8	40.4	41.4	40.5	33.3	29.3
In access to external financing through the usual financing channels	11.1	9.5	13.6	20.7	23.1	5.6	43.4	18.8	9.0	6.8
In customers' ability to pay and meet contractual conditions	20.5	20.3	20.8	21.9	22.4	18.8	20.9	23.7	18.3	21.3
In availability of supplies from the usual suppliers	17.1	16.5	21.4	14.2	18.7	19.3	23.1	19.7	12.1	6.8

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Very similar results to the ones concerning changes in level of demand are reported by Lithuanian firms for the shock of volatility/uncertainty of demand. Similarities are related to both — direction of the shock and the strength of its effect on activity of the firms. The shock related to the changes in external financing conditions, even though identical in the direction of the other two shocks, was of much lower importance. A much lower share (less than 30%) of the firms reported that an adverse change in access to external financing affected negatively their activity (both strongly and moderately) in the period of 2008–2009; the fraction of such firms is even smaller (less than 20%) in the period thereafter. The positive impact of the shock was verified to be broadly insignificant in both periods (4.8% and 11.1% in

<sup>2</sup> The WDN3 survey gathered information about the shares of revenues that Lithuanian firms earn from sales in domestic and foreign markets. This data was gathered under the non-core block on *Price setting and price changes*. The figures reveal that the most export-oriented sector in economy is manufacturing, exporting 51.8 per cent of the production. The most domestically-oriented sector is financial intermediation, selling 10.7 per cent of their products and services on foreign markets. The construction sector reports exports comprising 14.2 per cent of their revenues, trade — 20.6 per cent and business services — 25.2 per cent.

2008–2009 and 2010–2013 respectively) implying also that two thirds of Lithuanian firms evaluated this shock as having no significant impact on their activity.<sup>3</sup>

Those firms that reported an adverse change in customers' ability to pay and meet contractual conditions, judged this shock to be among the most important ones in the periods of 2008–2009 and 2010–2013. Worsening customers' ability to pay (both strongly and moderately) was reported by more than half of the firms in 2008–2009 and by one third in the period of 2010–2013. Divergences across firm sizes and sectors are present, although the results are very much conditioned on the shock, determining shifts in the level of demand. In particular, those sectors of the economy that were hit by the negative demand shock the most in 2008–2009 tended also to report the adverse effect on their activity of change in customers' ability to pay. The same argument is valid when different firm sizes are considered — a higher share of large and very large firms were exposed for the negative shock as compared to the other size bins. Still, in 2010–2013 the high share of the firms operating in the construction sector (over 40%) experienced a negative impact of this shock, which might be one of the reasons for weaker recovery patterns of this particular sector in the after-crisis period (see Section 3).

A shock related to the changes in the availability of supplies from usual suppliers fall under the category of shocks that do not seem to have a high impact on the performance of Lithuanian firms. Over two thirds of the firms (around 70%) reported no effect of this shock in both periods under consideration — 2008–2009 and 2010–2013.

## 4.2 Persistence of the shocks

Perception of the firms over persistence of all these shocks was also investigated by the WDN3 survey. In particular, Lithuanian firms were asked whether both positive and negative shocks were considered to be transitory, partly persistent or longer-lasting. Such insights could be of importance analysing the choices of the firms for the cost adjustment strategies, or more precisely, which particular strategy is preferred under different duration of the shocks. As Lithuanian firms evaluated shifts in demand being the most important among all the external shocks, this sub-section summarises only results over persistency in it. The results are presented in Table 7 conditioning them to both — positive and negative — directions of the shock.<sup>4</sup> Firm-level results for the remaining shocks are presented in Tables A2a–A2d of Appendix A.

Table 7. Persistence of level of demand shock; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
<b>STRONG OR MODERATE DECREASE</b>										
Transitory	30.5	27.9	33.9	38.2	54.3	35.1	35.4	23.5	33.7	35.0
Only partly persistent	45.8	47.0	37.6	54.8	32.7	38.4	45.9	54.3	40.5	55.7
Long-lasting	23.7	25.1	28.5	7.0	13.0	26.6	18.7	22.2	25.8	9.3
<b>STRONG OR MODERATE INCREASE</b>										
Transitory	55.5	58.7	45.4	50.0	45.9	22.8	16.6	61.3	73.1	22.8
Only partly persistent	35.6	33.6	36.9	50.0	54.1	65.8	83.4	31.3	15.3	77.2
Long-lasting	9.0	7.7	17.8	0.0	0.0	11.4	0.0	7.4	11.6	0.0
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
<b>STRONG OR MODERATE DECREASE</b>										
Transitory	25.7	29.3	4.4	18.3	50.2	12.8	45.4	16.3	31.3	15.3
Only partly persistent	49.1	45.0	71.5	62.4	16.4	72.4	50.3	51.8	36.3	63.1
Long-lasting	25.2	25.7	24.1	19.3	33.4	14.8	4.3	32.0	32.5	21.6
<b>STRONG OR MODERATE INCREASE</b>										
Transitory	48.6	52.2	39.4	44.6	18.1	35.7	49.6	45.4	58.5	46.4
Only partly persistent	40.4	38.0	49.2	37.6	59.1	39.9	39.8	46.5	34.2	38.6
Long-lasting	11.0	9.8	11.4	17.8	22.8	24.4	10.6	8.1	7.3	15.1

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

<sup>3</sup> It should be noted that these results might be biased. The firms that had solvency problems due to financial constraints might have not survived the recent crisis episode of 2008–2009; therefore they are outside of the realised sample.

<sup>4</sup> This implies that results on the persistency of demand shock are calculated only for the firms whose activities were negatively and positively (strongly and moderately) affected by changes in level of demand in 2008–2009 and in 2010–2013.



Persistency of the negative demand shock in 2008–2009 was evaluated unevenly across different size bins and across sectors, although the majority of Lithuanian firms assessed it as being partly persistent. A high fraction of small and medium size firms also evaluated this shock as long-lasting; accordingly, assessment over the persistency of this shock by large and very large firms was more often reported to be of shorter longitude, i.e. transitory. Evaluation of the shock across sectors does not differ much depending on the market orientation — firms operating on foreign and domestic markets assessed the shock mostly as partly persistent. Those firms that experienced positive demand shifts in 2008–2009 assessed these changes mainly being of transitory nature, the same as in 2010–2013. The most noticeable exception in answers in 2010–2013 was recorded among the firms operating in manufacturing sector — positive effect of the shock was considered more often to be partly persistent or even long-lasting. These results could directly be linked to the market orientation, suggesting that export-oriented industries experienced increase in external demand earlier as compared to domestically oriented sectors of economy in the after-crisis period (see also Section 3).

### 4.3 Relevance of financing

The majority of Lithuanian firms — around 70 per cent in 2008–2009 and around 80 per cent in 2010–2013 — reported variations in external financing conditions being broadly unchanged (see sub-section 4.1), but the WDN3 survey aimed to investigate the financing issue more comprehensively due to its potential importance for firms' performance. In particular, the additional enquiry was made to Lithuanian firms asking to evaluate relevance of different types of finance and crediting conditions. The enquiry was formulated in a way that firms had to identify how relevant was availability of credit to finance working capital, new investment or to refinance debt as well as onerous financing conditions for activity of the firms. Selected firm-level results are listed in Table 8; its extended composition could be found in Tables A3a–A3f of Appendix A.

Results for Lithuania reveal that unavailability of credits to finance working capital along with strict crediting conditions was the most important factor regarding financing: about one third of Lithuanian firms reported limitations being important (relevant and very relevant) for their activity. The share of such firms is somewhat higher in the period 2008–2009 (around 30%) than in 2010–2013 (less than 30%).<sup>5</sup> However, credit restrictions were considerably more relevant for the very large firms in the crisis period as well as firms operating in construction sector in both periods, but of lowest importance in the financial intermediation sector. These trends generally regard all types of credits and crediting conditions.

Table 8. Relevance of financing; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
<b>RELEVANT AND VERY RELEVANT</b>										
Credit to finance working capital	28.4	27.8	30.8	25.7	44.3	24.2	37.3	29.5	27.6	13.2
Credit to finance new investment	22.4	21.4	25.4	23.1	25.4	22.2	33.3	16.9	24.8	15.5
Credit to refinance debt	18.2	17.9	15.9	21.5	39.3	18.4	29.6	17.5	16.3	10.8
Credit conditions to finance working capital	31.1	29.6	30.8	44.0	29.5	32.5	32.2	30.8	30.8	17.8
Credit conditions to finance new investment	22.2	20.6	24.1	31.4	25.4	20.0	27.2	20.2	24.1	15.5
Credit conditions to refinance debt	16.9	15.7	16.1	25.1	29.5	14.8	25.5	16.7	16.0	13.2
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
<b>RELEVANT AND VERY RELEVANT</b>										
Credit to finance working capital	27.4	29.6	22.9	13.4	26.9	23.0	35.9	23.7	30.1	14.5
Credit to finance new investment	21.3	22.4	16.7	19.4	18.7	15.6	36.3	18.4	21.4	16.4
Credit to refinance debt	12.6	12.4	12.3	12.7	22.4	2.5	20.1	13.7	13.6	8.7
Credit conditions to finance working capital	28.6	30.2	23.0	26.6	13.4	20.5	27.0	27.8	33.8	12.6
Credit conditions to finance new investment	22.5	23.1	19.8	23.9	14.2	16.3	30.3	19.7	25.2	18.3
Credit conditions to refinance debt	13.6	13.1	12.5	20.1	17.9	4.6	18.0	15.8	14.1	10.7

Notes: firm-weighted average.

Sources: Lithuanian WDN3 survey, authors' calculations.

<sup>5</sup> To compare, in 2008–2009 unavailability of credits to finance new investments and strict crediting conditions was relevant (accounts for both relevant and very relevant) for around 20 per cent of the firms respectively. The share of such firms was similar (around 20%) in 2010–2013. Credits to refinance debt along with crediting conditions were listed even of lower relevance.

#### 4.4 Evolution of components of total costs

Either in response to the external shocks (see sub-section 4.1) or due to other external or internal factors within the markets, Lithuanian firms tended to adjust their total costs in the reference periods. The WDN3 survey therefore engaged in collecting firm-level responses over evolution of total costs during periods of 2008–2009 and 2010–2013. In particular, the firms were asked to evaluate how total costs along with their components — labour costs, financing costs, costs of supplies and other costs — evolve during periods under consideration. Labour and to some extent other costs could be attributed to internal, whereas financing costs and costs of supplies — to external factors that determined the evolution of the total costs of the firms. Development of the former components of total costs might be to higher or lesser extent affected by internal decisions of firms, whereas of the latter components — by external conditions. Selected firm-level results are listed in Table 9 with its extended composition in Tables A4a– A4e of Appendix A.

Table 9. Evolution of total costs and its components; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
<b>STRONG OR MODERATE DECREASE</b>										
Total costs	43.5	42.5	42.3	51.0	59.8	45.1	55.8	44.0	39.9	28.2
Labour costs	36.7	35.5	35.0	43.9	70.5	37.1	45.6	38.8	33.0	28.6
Financing costs	6.9	6.2	7.5	5.9	34.4	4.1	13.3	8.7	5.3	0.0
Costs of supplies	18.6	17.5	20.3	19.5	40.2	18.9	30.3	16.4	17.9	6.1
Other costs	20.3	19.8	21.1	21.1	29.6	0.0	14.9	23.3	27.6	22.2
<b>STRONG OR MODERATE INCREASE</b>										
Total costs	27.1	24.9	35.2	28.6	25.4	16.4	24.9	24.7	34.4	28.6
Labour costs	31.5	31.8	33.1	30.8	9.8	24.4	25.1	32.3	35.7	21.6
Financing costs	22.6	21.9	19.1	32.8	31.2	21.2	10.6	25.7	23.5	16.0
Costs of supplies	44.9	44.2	47.7	48.1	27.1	53.9	31.5	42.8	46.0	38.5
Other costs	41.3	37.1	53.7	48.1	54.6	31.4	23.4	40.0	52.0	52.8
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
<b>STRONG OR MODERATE DECREASE</b>										
Total costs	20.7	21.4	15.3	24.0	23.1	29.1	15.9	18.5	20.8	9.1
Labour costs	14.2	16.2	5.4	11.6	13.4	12.4	10.0	14.6	16.0	11.8
Financing costs	13.4	11.3	14.4	29.5	32.1	11.6	9.5	16.2	13.3	6.8
Costs of supplies	8.3	8.0	9.0	8.2	14.9	8.1	4.2	10.6	7.8	6.1
Other costs	10.1	9.1	10.3	19.0	14.0	0.0	7.7	12.3	13.8	11.1
<b>STRONG OR MODERATE INCREASE</b>										
Total costs	55.8	54.2	64.3	53.0	62.7	48.3	60.8	56.8	56.3	59.7
Labour costs	67.8	65.7	79.5	63.4	76.1	69.8	72.3	70.5	63.0	62.7
Financing costs	19.4	19.2	20.9	16.4	28.4	17.8	16.1	20.8	19.9	20.5
Costs of supplies	62.9	61.0	71.8	65.4	59.7	67.5	58.9	65.9	59.7	58.6
Other costs	79.9	81.0	82.1	68.7	62.0	94.9	84.2	82.2	69.4	75.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Firm-level results reveal that in the period of 2008–2009, the majority of Lithuanian firms (over 40%) experienced a decline (both strong and moderate) in total costs, although a sizeable share of firms (over 25%) reported also an increase in those. The period of 2010–2013, on the other hand, was denoted by a high share (over 50%) of firms recording an increase in total costs. A decrease in total costs in 2008–2009 was the most notable among large and very large firms as well as in the construction sector (also trade), already signalling for the impact of external shocks (see Section 3 and sub-section 4.1) to the internal cost-cut decisions. The same argument is valid considering export oriented industries, in particular manufacturing. Although (for instance) demand shock was mainly of foreign, not domestic, origin, decrease in total costs was also recorded here. During the period of 2010–2013, the marginal increase in total costs above the average was mainly again reported by very large firms and firms operating in construction sector, although relationship of these development patterns with intensity of external shocks (see sub-section 4.1) is less profound.

Majority of those firms that reported decrease in total costs in 2008–2009, also recounted that reduction (both strong and moderate) was mainly driven by labour costs (almost 40%); also to some extent other costs (over 20%). Other components contributed less — a decline in financing costs and costs of supplies was reported by lower shares (6.9% and 18.6% respectively) of Lithuanian firms. Considering divergences across size bins and sectors of economy, again, the highest proportions of the firms reporting reduction in all the total cost components were among large and very large firms as well as among firms operating in construction sector. The period of 2010–2013, was denoted mainly by increase in total costs for Lithuanian firms; it was also represented by a high share of the firms reporting increase in broadly all the

components of total cost: labour and financing costs (67.8% and 19.4% respectively), costs of supplies and other costs (62.9% and 79.9% respectively). Divergences across firm sizes and sectors for this period are almost negligible or at least much smaller as compared to the period of 2008–2009.<sup>6</sup>

#### 4.5 Evolution of components of labour costs

Decrease in total costs in 2008–2009 was to a high extent driven by the evolution the labour costs. In 2010–2013 increase in total costs was determined basically by all the cost components, although labour costs remained important factor explaining such trends (see sub-section 4.4). The WDN3 survey thereby investigated explicitly how labour costs in 2008–2009 and 2010–2013 evolved; in particular, the focus was on the development of the components of labour costs and identification of the main factors driving changes in those. The pre-determined components of the labour costs included changes in base wages, flexible wage components, the number of permanent and temporary employees, the number of agency workers, as well as adjustments in working hours and other components of labour costs. Table 10 and Tables A5a–A5g in Appendix A summarise selected results for Lithuania.

Table 10. Evolution of labour costs and its components; percentage of firms

	2008–2009									
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
<b>STRONG OR MODERATE DECREASE</b>										
<i>Labour costs</i>	36.7	35.5	35.0	43.9	70.5	37.1	45.6	38.8	33.0	28.6
Base wages or piece work rates	34.6	34.1	32.6	39.4	50.8	37.1	37.9	32.2	35.1	23.6
Flexible wage components	33.3	31.2	34.4	42.5	59.8	31.4	34.3	36.9	30.9	27.2
Number of permanent employees	26.0	23.7	29.0	32.7	51.7	26.6	28.9	25.1	25.8	23.6
Number of temporary/fixed-term employees	6.8	5.7	6.0	14.0	20.3	7.1	15.0	3.4	7.5	8.5
Number of agency workers and others	3.2	2.0	5.8	6.6	9.8	1.7	4.1	3.4	3.6	2.4
Working hours per employee	14.8	15.7	11.2	13.5	19.7	23.4	20.9	9.5	14.3	7.0
Other components of labour costs	20.7	21.3	7.1	48.2	49.8	3.3	4.1	57.0	14.0	39.5
<b>STRONG OR MODERATE INCREASE</b>										
<i>Labour costs</i>	31.5	31.8	33.1	30.8	9.8	24.4	25.1	32.3	35.7	21.6
Base wages or piece work rates	21.9	21.5	24.9	20.5	14.9	16.3	24.1	19.4	26.3	14.9
Flexible wage components	15.0	13.3	18.2	23.4	6.6	7.1	13.6	10.4	22.8	14.3
Number of permanent employees	12.4	11.7	16.6	11.6	5.7	15.0	13.4	9.7	13.4	12.8
Number of temporary/fixed-term employees	6.5	6.4	5.8	8.8	4.2	0.6	13.7	2.0	11.3	6.7
Number of agency workers and others	3.6	3.6	4.6	2.4	0.8	0.0	4.1	2.0	6.4	7.9
Working hours per employee	5.5	5.4	4.6	8.5	0.8	1.9	8.2	5.1	6.6	9.6
Other components of labour costs	31.4	28.7	45.9	19.8	0.0	6.7	45.0	18.3	49.7	11.1
<b>2010–2013</b>										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
<b>STRONG OR MODERATE DECREASE</b>										
<i>Labour costs</i>	14.2	16.2	5.4	11.6	13.4	12.4	10.0	14.6	16.0	11.8
Base wages or piece work rates	9.2	10.1	3.2	12.3	8.9	8.2	8.7	6.5	12.2	5.9
Flexible wage components	10.6	11.1	5.3	16.1	14.1	9.2	10.7	7.9	13.7	6.9
Number of permanent employees	14.6	14.6	10.1	20.1	33.7	12.4	13.1	10.4	19.9	13.7
Number of temporary/fixed-term employees	4.4	3.9	5.1	9.0	4.5	2.6	4.8	2.3	7.0	3.9
Number of agency workers and others	2.1	1.3	3.9	6.3	4.5	1.0	3.6	0.0	3.9	2.0
Working hours per employee	7.3	8.2	4.3	4.2	4.5	8.3	2.4	4.8	10.8	5.9
Other components of labour costs	22.9	23.9	15.1	35.3	0.0	32.2	15.4	40.8	8.7	33.0
<b>STRONG OR MODERATE INCREASE</b>										
<i>Labour costs</i>	67.8	65.7	79.5	63.4	76.1	69.8	72.3	70.5	63.0	62.7
Base wages or piece work rates	64.3	62.8	74.0	55.8	82.1	73.0	62.7	68.2	57.7	59.9
Flexible wage components	44.5	40.8	55.1	54.6	73.2	61.4	40.3	43.1	39.8	39.7
Number of permanent employees	36.5	34.7	48.5	31.1	28.2	49.9	39.0	35.0	30.9	40.3
Number of temporary/fixed-term employees	13.3	13.1	12.0	14.9	26.1	8.9	22.8	12.9	12.3	13.3
Number of agency workers and others	6.2	5.2	8.7	11.5	4.5	7.3	4.8	7.3	5.2	5.4
Working hours per employee	16.0	16.1	15.4	15.4	18.6	19.7	32.2	10.0	14.3	11.7
Other components of labour costs	50.1	53.0	42.4	36.4	38.6	46.1	60.9	45.9	48.9	24.8

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Cut in base wages and flexible wage components were the measures considered the most by Lithuanian firms to control labour costs in 2008–2009. Around one third (more than 30%) of the firms in this period reported reduction (both strong and moderate) in these inputs. Among other components, reduction in the number of permanent employees (around

<sup>6</sup> Interestingly, a relatively low fraction of Lithuanian firms in 2008–2009 reported a positive effect of external shocks on their activity (no more than 13% depending on shock), but around one third (almost 30%) experienced increase in total costs in this period. The rise was driven by all the cost components: around 40 per cent of the firms reported increase in costs of supplies and other costs, lower fractions — increase in labour (around 30%) and financing costs (over 20%).

25%), reduction of working hours (almost 15%) and other components of labour costs (around 20%) were used as corrective measures, though by a somewhat smaller share of firms. On the other hand, other components of labour costs were also reported to increase by one third of Lithuanian firms. Divergences across size bins are notable: cut in majority of labour cost components was more frequent in very large firms, i.e. the firms that reported higher exposure to the external shocks (see sub-section 4.1). No clear pattern between sectors reporting cost cuts was observable, although the construction sector more often indicated strong as opposed to moderate decrease in costs — these trends are definitely associated with the fact that this sector was hit by economic crisis harshest (see Section 3 and sub-section 4.1).

Considering the period of 2010–2013, which was characterised by an overall increase in labour costs, the same components — base wages (over 60%), flexible wage components (over 40%), number of permanent employees (over 35%), other components to labour (over 50%) and increase in working hours (16.0%) — were driving up the labour costs of Lithuanian firms. The increase in base wages, flexible wage components, the number of permanent employees was the most perceptible in manufacturing and larger companies, whereas increase in other components of labour costs, working hours, number of temporary employees — in the construction sector.

#### **4.6 Evolution of total and labour costs under different types of external shocks**

It was already noted that different directions, types and intensities of external shocks might (at least partially) explain development of the costs of Lithuanian firms in the reference periods. In order to get a broader picture of this issue, the effect of the shocks on cost-development is investigated more extensively. Tables 11 and 12 present results for Lithuanian firms on total and labour cost adjustment strategies under different external shocks.<sup>7</sup> Indeed, firm-level evidence suggests that the evolution of total and labour costs in Lithuania tends to covariate very much with external shocks: different types, intensities and especially directions of these shocks affect cost-adjustment decisions of the firms.

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<sup>7</sup> In particular, the results presented in Tables 11 and 12 are conditioned only on those firms that reported the non-zero effect of external shocks on their activity. Also, if, for instance, the firm reported the negative (positive) effect of demand shock, it is investigated whether it led to the decision to reduce (increase) costs and its components.

**Table 11. Strong and moderate decrease/increase in total costs and its components under different types of shocks; percentage of firms**

2008–2009					
STRONG OR MODERATE DECREASE	STRONG OR MODERATE DECREASE				
	Total costs	Labour costs	Financing costs	Costs of supplies	Other costs
In level of demand	61.9	51.8	8.8	26.6	24.3
In volatility/uncertainty of demand	62.8	51.7	10.1	29.8	27.5
In access to external financing through the usual financing channels	60.1	57.0	16.2	24.0	21.3
In customers' ability to pay and meet contractual conditions	53.9	45.9	7.2	21.6	26.8
In availability of supplies from the usual suppliers	59.1	52.7	13.9	24.4	14.2
STRONG OR MODERATE INCREASE	STRONG OR MODERATE INCREASE				
	Total costs	Labour costs	Financing costs	Costs of supplies	Other costs
In level of demand	45.6	58.1	21.3	57.0	54.7
In volatility/uncertainty of demand	59.0	65.9	23.0	64.5	73.7
In access to external financing through the usual financing channels	35.6	58.7	34.1	66.2	65.2
In customers' ability to pay and meet contractual conditions	47.1	56.7	33.1	40.7	63.8
In availability of supplies from the usual suppliers	43.0	64.7	33.9	58.5	46.8
2010–2013					
STRONG OR MODERATE DECREASE	STRONG OR MODERATE DECREASE				
	Total costs	Labour costs	Financing costs	Costs of supplies	Other costs
In level of demand	40.5	29.3	8.8	13.6	15.2
In volatility/uncertainty of demand	40.2	31.1	10.0	16.2	11.3
In access to external financing through the usual financing channels	28.9	21.2	11.6	9.6	6.7
In customers' ability to pay and meet contractual conditions	26.9	22.1	10.8	9.0	10.8
In availability of supplies from the usual suppliers	34.6	27.0	18.2	16.8	6.3
STRONG OR MODERATE INCREASE	STRONG OR MODERATE INCREASE				
	Total costs	Labour costs	Financing costs	Costs of supplies	Other costs
In level of demand	66.0	78.9	21.7	71.6	81.5
In volatility/uncertainty of demand	67.5	79.5	20.3	69.9	81.5
In access to external financing through the usual financing channels	67.5	80.1	41.8	75.9	83.3
In customers' ability to pay and meet contractual conditions	72.8	83.4	25.9	71.8	77.6
In availability of supplies from the usual suppliers	76.9	87.2	30.6	82.3	89.6

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

In analysing the response of total cost components to external shocks, firm-level results reveal that the direction and intensity of shocks mostly affect development of labour and other costs in Lithuania. As noted above, one of the reasons explaining such trends is properties of these cost components — both labour and other costs vary very much depending on firms' internal decisions, these costs fall inside the control area of the firms and therefore could be easily affected if needed. Development of labour costs, however, could be related to labour market institutions, in particular, characteristics of labour laws and the collective wage bargaining system (see also Sections 5 and 6), but this does not seem to be the case for Lithuania. Evolution of labour costs is tightly correlated to the direction of the external shocks in both good and bad times; that would lead to the preliminary conclusion of high degree of flexibility of this cost component. Base wages, flexible wage components and (to a lesser extent) the number of permanent employees were the most common measures used to control for labour input — that would be an additional support for high degree of flexibility on Lithuanian labour market.

Table 12. Strong and moderate decrease/increase in labour costs and its components under different types of shocks; percentage of firms

2008–2009								
STRONG OR MODERATE DECREASE	Labour costs	STRONG OR MODERATE DECREASE						
		Base wages or piece work rates	Flexible wage components	Number of permanent employees	Number of temporary/fixed-term employees	Number of agency workers and others	Working hours per employee	Other components of labour costs
In level of demand	51.8	49.8	50.1	39.3	8.8	3.4	20.7	22.4
In volatility/uncertainty of demand	51.7	49.5	49.8	38.7	8.5	3.6	21.5	24.8
In access to external financing through the usual financing channels	57.0	48.1	42.0	38.0	9.0	6.3	20.4	29.3
In customers' ability to pay and meet contractual conditions	45.9	45.2	44.4	38.6	8.1	3.2	18.6	32.4
In availability of supplies from the usual suppliers	52.7	50.0	46.9	41.5	9.2	5.8	23.3	48.2
2008–2009								
STRONG OR MODERATE INCREASE	Labour costs	STRONG OR MODERATE INCREASE						
		Base wages or piece work rates	Flexible wage components	Number of permanent employees	Number of temporary/fixed-term employees	Number of agency workers and others	Working hours per employee	Other components of labour costs
In level of demand	58.1	40.6	37.5	20.8	10.3	4.6	4.9	22.4
In volatility/uncertainty of demand	65.9	52.7	37.9	19.3	12.8	8.2	12.7	59.7
In access to external financing through the usual financing channels	58.7	46.3	48.4	8.4	20.7	4.0	1.6	38.5
In customers' ability to pay and meet contractual conditions	56.7	40.3	33.7	18.2	9.8	12.3	13.6	41.8
In availability of supplies from the usual suppliers	64.7	51.1	30.8	23.7	22.2	11.5	16.3	71.5
2010–2013								
STRONG OR MODERATE DECREASE	Labour costs	STRONG OR MODERATE DECREASE						
		Base wages or piece work rates	Flexible wage components	Number of permanent employees	Number of temporary/fixed-term employees	Number of agency workers and others	Working hours per employee	Other components of labour costs
In level of demand	29.3	24.0	25.9	29.7	9.3	2.9	16.7	26.8
In volatility/uncertainty of demand	31.1	24.5	27.3	32.2	9.8	2.7	15.5	32.8
In access to external financing through the usual financing channels	21.2	15.8	18.1	18.3	6.8	3.5	9.8	45.9
In customers' ability to pay and meet contractual conditions	22.1	14.6	20.7	21.9	9.3	3.9	9.5	22.5
In availability of supplies from the usual suppliers	27.0	18.3	20.3	18.5	10.4	1.7	7.0	29.3
STRONG OR MODERATE INCREASE	Labour costs	STRONG OR MODERATE INCREASE						
		Base wages or piece work rates	Flexible wage components	Number of permanent employees	Number of temporary/fixed-term employees	Number of agency workers and others	Working hours per employee	Other components of labour costs
In level of demand	78.9	81.2	65.0	50.6	18.9	9.6	21.0	47.7
In volatility/uncertainty of demand	79.5	81.5	66.4	48.6	19.0	10.4	22.1	52.2
In access to external financing through the usual financing channels	80.1	73.5	56.8	47.7	15.5	8.7	18.4	78.5
In customers' ability to pay and meet contractual conditions	83.4	90.4	68.9	49.0	17.9	10.6	20.4	66.9
In availability of supplies from the usual suppliers	87.2	91.2	59.2	53.2	26.6	13.5	22.6	90.4

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

In 2008–2009 around half of Lithuanian firms reported a decrease in labour costs in association with the negative impact of economic and financial shocks. The importance of all shocks, pre-determined by the WDN3 survey, was rather equal, though Lithuanian firms tended to adjust labour costs more often in the presence of adverse change in external financing. Those firms that reported a positive effect of the shocks on their activity in 2008–2009, also to a high extent (over 50%) confirmed increase in labour costs in the same direction as direction of the shocks. Development of other total cost components in 2008–2009 matched less trends in external shocks, although a high fraction of the firms that reported a positive effect of the shocks on their activity also experienced a substantial increase in costs of supplies (from 40.7% to 66.2% of firms). Decrease in this cost component in the presence of adverse shocks was reported, however, by a lower fraction of Lithuanian firms (less than 30%). In general, the latter results suggest that the majority of Lithuanian firms faced an increase in the costs of supplies in this period, as the evolution of this total cost component, along with financing costs, falls usually outside control of the firms and cannot be easily adjusted by the firms in need. Development of total costs in 2008–2009 was thereby determined mainly by movements in labour costs, the same as in 2010–2013.

In 2010–2013 some patterns differed, however. Although labour costs were the driving component of the total costs, a much lower fraction of firms (less than 30%), reporting the negative effect of the shocks on their activity, engaged in labour cost reduction strategies. It might be associated with the overall improvement in economic conditions and enhanced development of the Lithuanian labour market (see Section 3), showing also some degree of asymmetry in adjustment strategies in the crisis and economic recovery periods. The majority of Lithuanian firms in this period reported the positive effect of external shocks on their activity (see sub-section 4.1) and consequent increase in labour costs. Base wages, flexible components, and (to a lesser extent) an increase in the number of employees, were again those components that drove labour and, thereby, total costs up. The period of 2010–2013 was also denoted by a substantial increase in other components of labour costs. The type of the external shocks did not to a high extent affect the responses of the firms — all shocks equally affected the evolution of total cost components with the most notable exception for financing costs; these tended to increase more with enhanced access to external financing.

## 5. WDN3 survey results: labour force adjustments

Although the evolution of labour costs signals a high degree of flexibility of the Lithuanian labour market, the institutional structure of the economy might affect the cost-adjustment decisions of the firms. Therefore, the characteristics of the labour market institutions and the effect of labour market structural reforms on decision-making were covered by the WDN3 survey. These features help to understand the institutional environment in which Lithuanian firms are operating. Regarding labour market institutions, the survey provides firm-level information on the coverage of the collective wage bargaining system in Lithuania and the level of the economy at which wages are usually collectively bargained. This structural indicator and its effect on labour market variables is presented in the introductory part of the next section (see Section 6). Also, in some particular situations the WDN3 survey covers the role of employment protection legislation (EPL) in decision-making processes of the firms. The EPL index for Lithuania, derived on the basis of OECD methodology, is discussed more extensively under the topic of the labour market institutional environment (sub-section 5.1). Micro-level evidence on the importance of labour market institutions on labour force adjustment decisions of Lithuanian firms is presented and discussed as well. In particular, the WDN3 survey collected data on the composition of the labour force (sub-section 5.2). This information might provide evidence that the labour force or, in general, cost adjustment strategies are dependent on the compositional features. The most popular measures to alter labour input and differences in labour force adjustment strategies under various types and intensities of shocks are introduced onwards (sub-sections 5.3–5.4). As employment laws also might matter for labour force adjustment strategies, the WDN3 survey asked explicitly the question of employers' perceptions of how employment protection legislation evolved between 2010 and 2013 (sub-section 5.5). The survey also evaluated the impact of labour laws on the hiring decisions of Lithuanian firms, although other factors, falling outside the conventional definition of labour market institutions, were considered by the survey as well (sub-section 5.6).

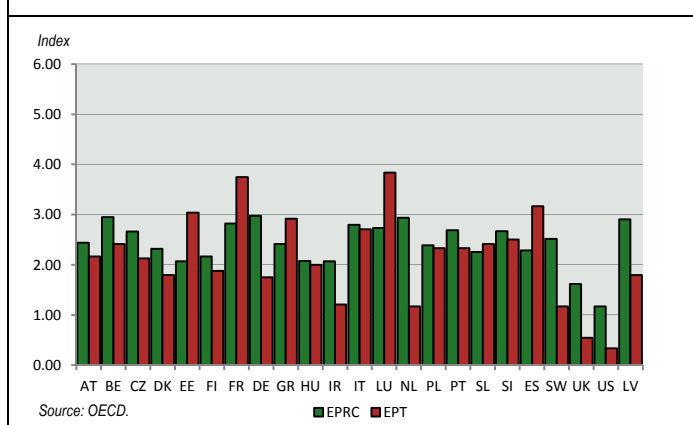
### 5.1 Labour market institutions: employment protection legislation

The collective wage bargaining system is usually associated with the wage setting process in the economy, whereas EPL is directly linked to the turnover on the labour market. Strictness of employment protection laws falls under the definition of labour market structural indicators and is considered to have a real effect on the labour market variables. This sub-section reviews economic literature that analyses the real effects of legislation on labour market outcomes, presents measures that quantify the strictness of employment protection and provides some information on labour market characteristics in Lithuania.

Importance of employment protection laws in labour market literature usually arises in the context of speed of filling in vacancies and labour costs. Stricter employment protection reduces labour market turnover; this might lead to increased growth in wages, thereby, having an adverse effect on the demand for labour. The true impact, however, is inconclusive as the effect of laws on labour market outcomes stems simultaneously in different and rather opposite directions.

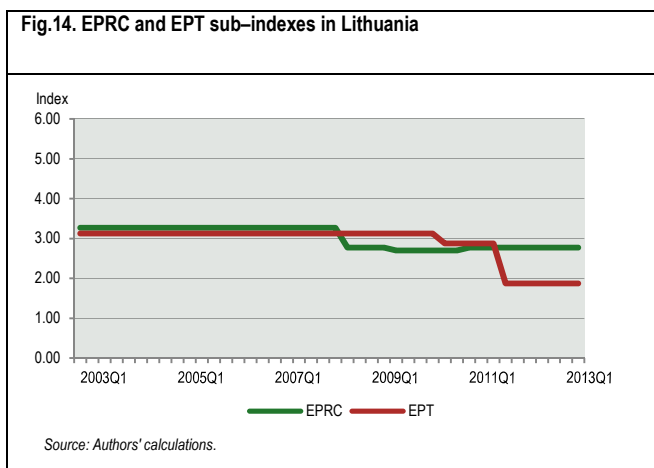
With regard to labour market turnover, it is considered that less liberal labour laws suppresses the speed of filling in vacancies and inflows from unemployment. In the meantime, a decrease in inflows into unemployment could be simultaneously observed, to the end, having no net effect on unemployment rate. The structure of unemployment, though, might change. Depressing hiring and firing processes, less liberal labour laws might lead to an increase in long-run and a decrease in short-run unemployment rates as well as a longer time for the labour market to adjust to a variety of macroeconomic shocks. The effect of employment laws on labour costs could be analysed acknowledging that stricter employment protection increases the bargaining power of employees and thus puts pressure on wage claims. If an increase in wages is not offset by productivity growth, negative effects on demand for labour could be present. The effect on productivity from employment protection laws might stem from two different sources. Stricter employment protection encourages long-lasting

Fig.13. EPRC and EPT sub-indexes in selected countries in 2013



employment. It encourages cooperation between employees and enlarges investment into training that, in turn, might lead to a boost in productivity growth. In this situation, even though stricter employment protection presses up wages in economy, this increase might totally be offset by growth in productivity. In the presence of stricter laws, however, replacement of less productive staff with more productive workers is restricted and could equally dampen down adjustment to the technological changes causing a slow-down in productivity growth. The dominant net effect of employment protection on productivity and wage growth is thereby inconclusive.<sup>8</sup>

EPL index, developed by OECD, is the most frequently used quantitative measure to evaluate strictness of employment protection laws. It covers however only particular parts of laws regulating labour market. The sub-indicators of EPL index — employment protection for regular contracts (EPRC) and employment protection for temporary contracts (EPT) — for selected OECD economies and Lithuania are shown in Fig. 13 and 14; the higher the value of the sub-index, the stricter employment protection for certain types of employment contracts.<sup>9</sup> The complete derivation of the EPL index for Lithuania is presented in Appendix B and, in comparison to the other Baltic States, Lithuania has similarly strict employment protection regulations.



In the period of 2009–2010 Lithuania underwent simplification in EPL, some of the easing measures being temporary and some — permanent. This caused EPRC sub-index to drop by the end of 2008 and to return somewhat back closer to its initial value in 2011. Relaxation of the laws concerning temporary contracts caused the EPT sub-index to gradually decrease since 2010. Selected easing measures for Lithuania are listed below in Table 15, whereas the impact of these legislative measures on labour force adjustment strategies in Lithuanian firms is discussed in the following sub-sections.

**Table 15. Changes in labour laws — list of selected items**

Measure	Description of the measure	Length of the measure	Enacted; validity (from-to date)	In the EPL index
<i>Individual dismissals</i>	Shorter notice period for employers to terminate employment contracts (with absence of fault on the part of an employee).	Temporary	23 Jul 2009–31 Dec 2010	YES (EPRC)
	Easing for employers on the regulations to terminate employment contracts with employees close to retirement age.	Temporary	23 Jul 2009–31 Dec 2010	NO
<i>Collective dismissals</i>	Relaxation of certain notification requirements on collective dismissals.	Permanent	1 Jul 2008	YES (EPRC)
<i>Temporary contracts and TWA</i>	Employers were allowed to conclude the fixed-term employment contracts for the work of permanent nature for newly created jobs.	Temporary	23 Jul 2009–1 Aug 2015	YES (EPT)
	Easing for employers on termination of fixed-term contracts.	Temporary	23 Jul 2009–31 Dec 2010	NO
	Equalisation of working conditions for employee working under fixed-term contracts to permanent ones.	Permanent	19 Apr 2011	NO
	Easing on provisions regulating teleworking contract.	Permanent	1 Aug 2010	NO
	Enactment of the law on Temporary Work Agencies.	Permanent	1 Dec 2011	YES (EPT)

<sup>8</sup> Nickell *et al.*, 2002; Nickell *et al.*, 2005; Baccaro, 2007, Young, 2003.

<sup>9</sup> Venn *et al.*, 2009.



<i>Working time</i>	Allowed longer hours for overtime working.	Temporary	23 Jul 2009–31 Dec 2010	NO
	Eligibility for all enterprises to introduce summary recording of working time.	Permanent	1 Aug 2010	NO
	Easing in applying overtime working schemes.	Permanent	1 Aug 2010	NO
<i>Remuneration</i>	Possibility for employer for shortened period to notify employee about changes in terms of remuneration.	Temporary	23 Jul 2009–31 Dec 2010	NO
	During the period of notice, lower average wage could be paid to employees seeking for a new job.	Temporary	23 Jul 2009–31 Dec 2010	NO
	Employers are entitled for longer periods to reimburse severance pay for dismissed employees.	Temporary	23 Jul 2009–31 Dec 2010	NO
	Termination of severance pay for an employee dismissed from the public service if that person becomes employed in public service again.	Permanent	17 Nov 2011	NO
<i>Others</i>	Decrease in social security contribution rates for newly hired (targeted certain groups)	Temporary	1 Aug 2010–31 Jul 2012	NO
	Easing for employees to suspend employment contract if employer fails to fulfil its obligations.	Permanent	1 Aug 2010	NO
	Tightened legal definition of the unemployed and strengthening control of unemployed persons.	Permanent	1 Aug 2009	NO

Sources: *Lithuanian Labour Code; other laws.*

## 5.2 Composition of labour force in Lithuanian firms

The WDN3 survey investigated the composition of the labour force by occupational groups and job tenure of Lithuanian firms. Compositional characteristics of the labour force might be relevant for understanding the behaviour of the firms. For example, the features of the labour force might help explain the incidence of wage cut/wage freeze against cut in employment in the presence of the adverse shocks. Although this section follows the previous structure of the paper and reviews only descriptive results of the WDN3 survey, a comparison of labour force composition across sectors and sizes of firms gives some information about the overall features of Lithuanian labour market. Table 16 reports composition of the labour force by occupational groups<sup>10</sup> and by job tenure in 2013.

Table 16. Composition of labour force in 2013; in per cent

	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
<b>By occupational groups</b>										
Higher skilled non-manual	53.7	57.8	45.0	34.8	26.6	23.3	32.5	60.0	67.8	81.7
Lower skilled non-manual	13.9	13.8	12.8	15.9	23.1	14.2	8.1	17.9	12.2	17.6
Higher skilled manual	16.5	15.3	18.4	22.8	23.8	27.1	33.3	10.6	11.9	0.0
Lower skilled manual	15.9	13.0	23.9	26.5	26.5	35.5	26.1	11.5	8.1	0.7
<b>By job tenure</b>										
Below 1 year	19.1	20.6	15.0	12.8	13.8	17.5	34.5	17.3	16.2	19.3
Between 1 and 5 years	39.9	42.1	33.6	33.3	28.4	36.5	42.2	35.6	44.3	46.7
More than 5 years	41.0	37.4	51.4	53.9	57.7	45.9	23.3	47.2	39.5	34.0

Notes: *firm-weighted averages.*

Sources: *Lithuanian WDN3 survey, authors' calculations.*

Weighed sample results reveal that on aggregate, the labour force in Lithuanian firms consists mostly of higher skilled non-manual (over 50%) workers. Lower skilled non-manual (13.9%), higher skilled manual (16.5%) and lower skilled manual (15.9%) workers form a much lower fraction of the labour force in Lithuanian firms.<sup>11</sup> The share of employees with a job tenure of more than 5 years (41%) is similar to the share of employees working from 1 to 5 years for their company (39.9%).

Divergences across sectors are also present: labour intense and service related sectors of the economy — trade, business services and financial intermediation — report much higher shares of higher skilled non-manual employees

<sup>10</sup> More precisely, occupational groups are divided into higher skilled non-manual (ISCO classification: 1, 2, 3), lower skilled non-manual (ISCO classification: 4, 5), higher skilled manual (ISCO classification: 7, 8) and lower skilled manual (ISCO classification: 9).

<sup>11</sup> Official data reported by Statistics Lithuania suggests that a share of higher skilled non-manual (ISCO classification: 1, 2, 3) workers by the end of 2013 in Lithuania formed around 45 per cent of the poll of employed persons. Lower skilled non-manual (ISCO classification: 4, 5), higher skilled manual (ISCO classification: 7, 8) and lower skilled manual (ISCO classification: 9) workers formed around 19 per cent, 27 per cent and 9 per cent of employed respectively.

(60%, 67.8% and 81.7% respectively). Manufacturing and construction, on the other hand, tend to report much higher than average fractions of higher and lower skilled manual workers (27.1% and 35.5% in manufacturing and 33.3% and 26.1% in construction respectively) in their labour force composition. The manufacturing sector in Lithuania also tends to have the highest share of lower skilled (both manual and non-manual), though with the longest job tenure, workers, reflecting the high fraction of low- and medium-tech production. Trade, business services and in particular financial intermediation are the sectors mostly over-represented by higher skilled non-manual workers. By firm size, small firms tend to be over-represented by higher skilled non-manual whereas larger firm have higher fractions of lower skilled workers. By job tenure, manufacturing and trade are those sectors with highest shares of employees working for more than 5 years, whereas in construction — highest share working below one year. Divergences of compositional effects by job tenure across different sizes of firms is lower, though small firms tend to have smaller proportion of staff working longer period of time indicating higher staff turnover in small firms.

### 5.3 Labour force adjustments: reduction of labour input and measures to reduce labour input

The WDN3 survey collected firm-level data about the share of Lithuanian firms that had to reduce labour input or alter its composition. This information enriches understanding in cost adjustment strategies of the firms, although related issues to a high extent have already been discussed in this paper (see Section 4). Table 17 reports results. Firm-level results suggest that in the period of economic crisis of 2008–2009, more than one third (35.3%) of Lithuanian firms had to reduce labour input or alter its composition; the fraction of such firms was considerably lower in the period thereafter (19.8%).

Table 17. Need to reduce labour input or alter its composition; percentage of firms

		2008–2009									
		Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Yes		35.3	33.6	33.5	48.0	55.7	39.0	47.7	29.4	36.0	26.8
No		64.7	66.4	66.5	52.0	44.3	61.0	52.3	70.6	64.0	73.2
		2010–2013									
		Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Yes		19.8	21.7	13.2	11.7	28.4	24.4	25.8	14.4	20.6	17.1
No		80.2	78.3	86.8	88.3	71.6	75.6	74.2	85.6	79.4	82.9

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Divergences across sectors and across different sizes of firms are significant — a higher shares of firms in the construction sector (almost 50%) and manufacturing (almost 40%) reported reduction of labour input in 2008–2009. Although these two sectors differ in their market orientation (the construction sector is domestic, whereas manufacturing is foreign oriented), both of them were hit by negative shocks in 2008–2009 severely (sub-section 4.1). These results are in line with the official statistics, reporting a strong decline in employment in these sectors (see Section 3) and pointing towards preliminary conclusion that the labour force adjustment strategies were more common in these activities as compared to the rest of the economy. The shares of the firms in trade and financial intermediation, reporting reduction of labour input or alteration of its composition, were on the other hand considerably lower than the economy average (almost 30%). By firm size, such measures were more prevalent among large and very large firms (around 50%), much more than on average. This is again associated with the effects of the shocks (see sub-section 4.1) on activity of the firms, as large and very large firms in Lithuania tended to report higher exposure to negative shocks in comparison to smaller firms. In 2010–2013, a smaller share of firms applying labour input alteration measures were in trade and financial intermediation (less than 20%), though higher — in very large companies (almost 30%).

Analysing the most popular measures, freeze or reduction in new hires was the primary measure used by Lithuanian firms to reduce labour input or alter its composition in both periods — the period of 2008–2009 and 2010–2013. The popularity of this measure is obviously due to the ease of its implementation, especially compared to the other possible measures listed in Table 18 with its extended composition reported in Appendix A, Tables A6a–A6g. This measure was reported to be strongly preferred by a high share of firms in 2008–2009 and 2010–2013 (48.7% and 31.3% respectively). During the crisis and in the period thereafter, individual layoffs and non-subsidised reduction in hours worked were also among the measures frequently applied by Lithuanian firms. More specifically, individual layoffs and reduction in working hours were used slightly or strongly (i.e. marginally, moderately and strongly) by more than half (81% and 55.1%

respectively) of the firms in the period 2008–2009; in 2010–2013 the share of such firms was lower (75.0% and 54.9% respectively).

Such measures as early retirement schemes, reduction of agency workers, non-renewal of temporary contracts at their expiration and, to a lesser extent, collective layoffs were less often used to control labour input by Lithuanian firms in all the analysed periods. There could be several reasons explaining such trends, but, at most, labour market institutions played a restrictive role. With regard to limited use of early retirement schemes, a significant role is played by the legal environment. It is noteworthy that there are two important aspects making this measure of limited use in Lithuania — early retirement is the individual choice of employees, thereby falling outside the control of employers; also, incentives for employees to go to early retirement are low when the financial aspects are considered. A reduction of agency and other workers was not extensively used by Lithuanian firms to reduce labour input. The reason for this again is the institutional environment, in particular that the law regulating temporary working agencies was enacted in 2011 only (see sub-section 5.1). Considerable legislative EPL easing measures on the regulation of temporary employment contracts occurred during 2009 (see sub-section 5.1), making this measure to control labour input also of limited importance. Collective dismissals, although used as a measure to reduce labour input by Lithuanian firms, takes a much longer time to implement as compared to the other measures; therefore it is applied only marginally.

Table 18. Measures used to reduce labour input or alter its composition; percentage of firms

	2008–2009									
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
	MARGINALLY, MODERATELY AND STRONGLY									
Collective layoffs	34.1	32.8	42.2	25.2	54.5	47.6	26.1	29.3	33.9	18.8
Individual layoffs	81.0	77.0	89.3	89.2	91.2	71.5	86.1	85.2	80.5	100.0
Non-subsidised reduction of working hours	55.1	55.2	49.7	62.9	53.0	64.0	55.6	39.9	62.0	31.7
Non-renewal of temporary contracts at expiration	25.9	25.3	21.3	33.1	35.8	38.7	28.2	14.2	26.9	38.6
Early retirement schemes	9.1	4.0	14.4	25.8	26.6	9.9	20.0	8.4	5.9	4.7
Freeze or reduction of new hires	78.2	73.5	88.8	87.9	83.7	85.9	87.4	66.5	79.5	91.8
Reduction of agency workers and others	18.6	19.4	16.6	18.7	10.2	25.2	24.7	6.7	21.7	24.5
	2010–2013									
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
	MARGINALLY, MODERATELY AND STRONGLY									
Collective layoffs	25.3	25.4	23.7	21.5	37.0	12.8	44.8	4.9	36.1	24.1
Individual layoffs	75.0	75.5	72.9	66.8	84.3	74.3	82.8	85.4	65.5	82.7
Non-subsidised reduction of working hours	54.9	56.2	50.6	50.9	31.4	76.5	43.6	29.2	65.2	21.2
Non-renewal of temporary contracts at expiration	22.8	19.9	24.9	67.0	31.9	21.7	22.0	6.2	34.1	12.0
Early retirement schemes	10.0	6.9	16.1	50.9	15.9	21.7	4.8	0.0	12.6	0.0
Freeze or reduction of new hires	74.7	79.2	38.6	77.0	68.4	72.1	77.2	65.9	81.4	37.5
Reduction of agency workers and others	24.0	26.5	7.4	28.1	0.0	40.7	23.2	0.0	30.9	12.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

In regard to divergences across firm size bins and sectors in 2008–2009, a higher share of larger companies used such measures as individual layoffs whereas collective layoffs was more popular in manufacturing sector. Divergences across firm sizes and sectors are less notable in 2010–2013.

#### 5.4 Labour force adjustment strategies under different types and intensities of the external shocks

It was revealed already that one of the reasons to make the decision to alter labour costs could obviously be the adversity of external economic conditions (see sub-section 4.6). It is also possible to investigate the same problem from the other angle, i.e. to study how the decisions of the firms to reduce the labour force or alter its composition depend on the economic environment. It is therefore examined whether the firms that reported a negative effect of the shocks on their activity tended more often to reduce the labour force or alter its composition. Responses of the firms are summarised in Table 19 showing that the choices of the firms are very much dependent on the direction and type of external shocks.<sup>12</sup> Results also reveal the presence of asymmetry in adjustment strategies in good and bad times — they tend to differ somewhat, depending on the overall economic environment.

<sup>12</sup> More precisely, the calculations of the results are restricted only to the firms reporting the non-zero impact of the shocks on their activity. The data is also conditioned only to the negative external shocks in order to better capture labour force adjustment decisions in association to adversity of economic conditions.

Table 19. Need to reduce labour input or alter its composition under different types of shocks; percentage of firms

	2008–2009									
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
<b>STRONG OR MODERATE DECREASE</b>										
In level of demand	52.0	52.0	44.9	59.4	73.9	51.8	60.5	40.5	61.2	38.5
In volatility/uncertainty of demand	53.3	52.9	45.5	61.6	85.1	59.2	59.9	45.5	57.2	33.6
In access to external financing through the usual financing channels	57.6	59.9	39.3	61.4	87.9	46.3	74.5	51.3	62.3	29.2
In customers' ability to pay and meet contractual conditions	46.2	47.2	36.8	53.4	64.9	49.7	51.9	39.8	49.8	37.8
In availability of supplies from the usual suppliers	52.2	50.2	45.5	65.8	87.7	40.6	90.3	44.1	57.5	63.0
<b>2010–2013</b>										
Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation	
<b>STRONG OR MODERATE DECREASE</b>										
In level of demand	33.6	35.7	23.8	27.4	33.4	50.5	38.2	27.7	29.4	14.4
In volatility/uncertainty of demand	35.7	37.7	23.4	32.7	43.0	40.0	32.9	31.6	37.7	19.0
In access to external financing through the usual financing channels	36.8	39.0	16.2	37.9	52.2	41.7	44.7	27.9	36.6	27.4
In customers' ability to pay and meet contractual conditions	28.7	31.1	16.2	14.1	51.3	36.3	23.5	23.5	32.7	23.0
In availability of supplies from the usual suppliers	31.7	35.8	1.3	29.6	52.2	51.1	16.2	21.1	38.6	100.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Firm-level results for Lithuania show that the firms, whose activities were negatively affected by adverse external shocks, more extensively reported the need to adjust the labour force or alter its composition in both reference periods. Around half of the firms that were hit by adverse shocks (strongly and moderately) in 2008–2009 report alteration of labour input as compared to one third (35.3%) of the economy in total. The share of such firms in 2010–2013 is smaller — around one third — as compared to 20 per cent of the economy in total (see also sub-section 5.3). These results also suggest that decisions to change the labour force or not are highly dependent on the state of economy: in the presence of negative external shocks in good times, the firms are less engaged in taking labour force alteration decisions than in bad times (see also sub-section 4.6). The type of the shock does not seem to affect much the decisions of the firms, although the most important shock listed by Lithuanian firms appears to be the change in the availability of external financing, whereas the least significant — change in customers' ability to pay — to make firms take decision on labour force reduction. By sectors, changes in access to external financing are reported to be of high importance in the construction sector and the least important to financial intermediation. However, these two sectors considered change in availability of supplies to be an important factor for decision-making.

In the presence of negative shocks, measures used (strongly) to reduce labour input are also dependent on the state of the economy. Such measures as collective layoffs were used by Lithuanian firms only in the period of crisis; individual layoffs were also less extensively used as a measure in the period of economic recovery. Freeze in new hires is, on the other hand, reported to be equally used as a measure to control labour input at any state of the economy; this measure is also the most crucial one in the need to reduce the labour force. The summary results are reported in Table 20.

Table 20. Measures used strongly to reduce labour input under different types of shocks; percentage of firms

	2008–2009						
	<b>STRONG OR MODERATE DECREASE</b>						
	Collective layoffs	Individual layoffs	Non-subsidised reduction of working hours	Non-renewal of temporary contracts at expiration	Early retirement schemes	Freeze or reduction of new hires	Reduction of agency workers and others
In level of demand	6.6	13.8	13.5	8.1	0.4	49.4	6.0
In volatility/uncertainty of demand	7.3	15.2	13.4	9.5	1.0	48.3	5.3
In access to external financing through the usual financing channels	4.9	12.4	15.5	12.2	0.7	48.4	8.8
In customers' ability to pay and meet contractual conditions	3.4	12.4	10.0	5.2	0.1	48.7	7.0
In availability of supplies from the usual suppliers	2.7	9.8	8.0	12.3	0.1	43.8	5.5
<b>2010–2013</b>							
	Collective layoffs	Individual layoffs	Non-subsidised reduction of working hours	Non-renewal of temporary contracts at expiration	Early retirement schemes	Freeze or reduction of new hires	Reduction of agency workers and others
In level of demand	0.0	6.7	12.1	3.6	0.0	46.9	10.3
In volatility/uncertainty of demand	0.0	7.4	13.4	4.0	0.0	52.1	11.4
In access to external financing through the usual financing channels	0.0	0.9	7.1	0.0	0.0	54.0	14.8
In customers' ability to pay and meet contractual conditions	0.0	3.1	5.4	3.4	0.0	48.7	7.8
In availability of supplies from the usual suppliers	0.0	0.0	12.4	7.8	0.0	42.4	1.9

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

## 5.5 Labour force adjustments: evolution of strictness of the labour laws

The WDN3 survey investigated employers' perception of how strictness of labour laws has evolved between 2010 and 2013. In particular, it was asked how Lithuanian firms evaluated changes in the labour laws in regard to collective dismissals, individual layoffs, layoffs due to disciplinary reasons, administrative burden to hire employees, possibilities to

adjust working hours, to move employees to other locations or across different job positions, to adjust wages or to pay lower wages for newly hired employees. As many regulations in the labour laws in Lithuania were simplified in 2009–2010 (see sub-section 5.1), evaluation of employers' perception is of importance for Lithuania. A summary of firm-level results is listed in Table 21 with its extended composition presented in Table A7 of Appendix A.

Results show that a majority of the indicators were evaluated by Lithuanian firms as being neither easier nor more difficult to implement, although some items, in particular individual dismissals, costs associated with hiring, wage adjustment and lower wages for newly hired, were considered by a higher fraction of Lithuanian firms as being more difficult to implement in 2013 as compared to 2010. Difficulties associated with individual dismissals could be related to EPL easing measures that occurred in 2009–2010, but were of a temporary nature (see sub-section 5.1), whereas difficulties to adjust wages or pay lower wages to newly hired employees should be associated with the improvement in the overall macroeconomic environment rather than changes in labour laws.

Table 21. Employers' perception about change in strictness of labour laws between 2010 and 2013; percentage of firms

	MUCH LESS DIFFICULT; LESS DIFFICULT									
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
To lay off employees for economic reasons (collectively)	1.4	1.5	1.0	0.0	4.5	0.4	0.0	1.4	2.1	3.8
To lay off employees for economic reasons (individually)	4.5	4.8	2.9	2.5	13.4	1.3	9.5	4.1	4.6	1.9
To dismiss employees for disciplinary reasons	12.1	11.5	14.3	14.5	9.0	9.4	10.6	13.1	13.1	3.8
To hire employees (cost of recruitment, including administrative costs)	10.4	10.3	10.9	12.1	4.5	2.6	19.7	12.1	9.3	3.8
To adjust working hours	6.2	6.6	4.3	5.8	9.0	2.5	8.6	6.0	7.4	1.9
To move employees to positions in other locations	4.0	3.4	5.3	6.5	9.0	1.9	9.2	2.7	4.4	1.9
To move employees across different job positions	6.3	6.0	5.2	9.4	13.4	2.4	12.2	4.2	7.9	1.9
To adjust wages of incumbent employees	8.3	9.2	5.2	5.5	9.0	1.4	18.1	10.4	6.2	8.0
To lower wages at which you hire new employees	3.4	2.5	7.6	3.2	9.0	0.4	8.1	3.2	3.4	1.9
	MUCH MORE DIFFICULT; MORE DIFFICULT									
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
To lay off employees for economic reasons (collectively)	12.7	12.3	16.8	8.5	12.7	4.9	17.1	13.8	13.9	6.1
To lay off employees for economic reasons (individually)	15.5	15.4	17.1	14.6	12.7	6.9	23.7	15.1	17.0	13.7
To dismiss employees for disciplinary reasons	7.8	6.2	13.4	12.4	9.0	13.2	5.0	7.7	6.7	1.9
To hire employees (cost of recruitment, including administrative costs)	27.8	27.0	29.2	35.6	14.2	25.8	39.3	27.8	24.7	29.3
To adjust working hours	11.3	8.9	20.1	18.9	8.2	8.5	9.4	13.0	11.7	12.6
To move employees to positions in other locations	10.6	9.3	13.6	20.0	4.5	9.5	7.8	11.2	11.6	10.7
To move employees across different job positions	9.0	7.1	15.8	16.3	3.7	6.4	9.6	9.4	9.7	9.5
To adjust wages of incumbent employees	24.2	22.3	25.4	37.0	22.4	22.0	23.1	24.3	25.2	27.8
To lower wages at which you hire new employees	27.5	24.1	34.2	48.6	27.6	34.9	28.2	29.0	22.5	30.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

## 5.6 Labour force adjustments: obstacles to hire with permanent contracts in 2013

As noted above, the WDN3 survey engaged in investigating the impact of labour laws on hiring decisions of Lithuanian firms in 2013. In particular, the survey investigated employers' perception about main obstacles to hire employees under permanent contracts. Other factors, falling outside the conventional definition of labour market institutions, were considered by the survey as well. Firing and hiring costs, labour taxation, wages, risks of changes of labour laws and to some extent the insufficient availability of labour with required skills (i.e. skill-mismatch) belong to the functional characteristics of the labour market, whereas uncertainty about economic conditions, access to finance, costs of other inputs complementary to labour and others — to external shocks or internal decisions of the firms. The relevance of all these factors for decision-making on whether to hire or not employees with a permanent contract are presented in Table 22 with its extended version in Table A8 of Appendix A.

Table 22. Obstacles in hiring workers with permanent, open-ended contracts in 2013; percentage of firms

	RELEVANT AND VERY RELEVANT									
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Uncertainty about economic conditions	67.0	67.7	66.9	65.9	42.5	65.3	79.9	62.2	68.3	49.8
Insufficient availability of labour with required skills	73.2	71.7	76.0	81.1	80.6	75.3	76.9	72.0	72.4	58.2
Access to finance	29.1	32.1	23.1	17.3	0.0	24.7	46.4	28.3	26.6	9.5
Firing costs	54.2	53.3	57.2	59.9	39.6	54.6	69.9	47.3	55.2	39.9
Hiring costs	45.4	46.2	44.7	41.8	26.9	49.4	46.6	43.3	45.5	29.3
High payroll taxes	84.4	84.0	85.7	88.8	74.6	78.1	86.7	84.3	87.1	64.6
High wages	70.3	69.3	72.6	75.6	71.7	64.6	76.7	65.6	75.1	60.8
Risks that labour laws are changed	49.6	49.5	50.1	54.5	26.1	54.3	46.9	46.9	51.1	39.6
Costs of other inputs complementary to labour	36.0	35.1	42.0	36.0	21.6	40.7	40.3	28.1	40.0	17.5
Other	91.5	91.9	84.9	96.0	100.0	86.8	88.1	87.2	98.1	84.9

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Among the factors that were noted by Lithuanian firms as being of importance for non-hiring decisions were labour market institutions, overall economic conditions and the personal qualifications of employees. Approximately two thirds of Lithuanian firms indicated that high payroll taxes (almost 85%), insufficient labour supply with certain skills (almost 75%), high wages (slightly over 70%) and uncertainty about economic conditions (almost 70%) were the factors (account for both relevant and very relevant) hindering the hiring of employees under permanent contracts. Labour laws also matter — firing and hiring costs, as well as risks that labour laws are changed, were important for half of Lithuanian firms (54.2%, 45.4% and 49.6% respectively). The answers of the firms were very similar within different size bins, although very large firms were less than average hindered from hiring under uncertain economic conditions (42.5%) or due to the risks that labour laws might change (26.1%), etc. Access to finance was more important for decision-making in the construction sector and less important in financial intermediation as compared to the aggregate economy; these results are broadly in line with the importance of financing conditions for labour force adjustment strategies in these sectors (see also sub-section 5.4).

## **6. WDN3 survey results: wage adjustments**

The WDN3 survey also aimed to gather information on wage adjustment strategies of Lithuanian firms. As the institutional structure of the Lithuanian labour market might affect wage setting behaviour, these issues are covered by the introductory part. In particular, the focus is on the labour market structural indicator — a collective wage bargaining system — that, in economic theory, is considered to be among the most important factors affecting wage setting decisions and causing wage rigidity (sub-section 6.1).

The WDN3 survey provides evidence on the type of collective wage bargaining agreements and the level of the economy at which such agreements are concluded. Coverage of collective bargaining agreements and the frequency of their renewal are also considered. This information gives preliminary insights as to whether the collective wage bargaining system could affect wage setting decisions of Lithuanian firms and be one of the sources of wage rigidity in Lithuania. It is worth mentioning that the data gathered by the survey covers only specific sectors of the economy (i.e. does not cover public sector activities and some private sector businesses), thereby providing only a rough picture of the collective wage bargaining system in Lithuania (sub-section 6.2). Firm-level data also provides evidence of wage indexation rules applied by Lithuanian firms. More specifically, the incidence of wage adjustment to inflation is investigated more closely. Although such type of wage adjustment should not always be directly linked to institutional environment, the presence of the indexation regulations would provide the evidence of the downward real wage rigidity stemming from labour market institutions with possible implications on the functioning of the labour market (sub-section 6.3). Other aspects of the Lithuanian labour market are also considered by the WDN3 survey. Frequency of base wage adjustment and incidences of nominal wage cuts and freezes provide information about downward nominal wage rigidity (sub-sections 6.4–6.5). Analysis of rigidities is important in the context of the functioning of the firms — flexible wages are a channel through which costs can be quickly adjusted in the presence of economic shocks. The WDN3 survey was designed, therefore, to assess wage flexibility from a number of different perspectives. Potential sources for the wage rigidity (sub-section 6.6) and the effect of labour market flexibility on the recovery patterns of Lithuanian firms in the after-crisis period (sub-section 6.7) enriches the study of this subject. The former question is assessed by investigating if labour market institutional structure induces additional wage inflexibility in Lithuania, whereas the latter — by analysing the recovery patterns of firms in 2010–2013 under different labour cost adjustment strategies in the previous period. Finally, the WDN3 survey investigates three additional variables — the share of labour costs to total costs, the proportion of flexible wage components to the total labour costs as well as exploring how the labour costs of employees evolve as compared to the costs of newly-hired. The first two variables help understand the importance of labour cost share for wage and price setting frequency and the speed at which the labour costs respond to economic shocks (sub-section 6.8). The third variable provides the evidence of wage flexibility and defines a potential (additional) source of control for labour costs (sub-section 6.9).

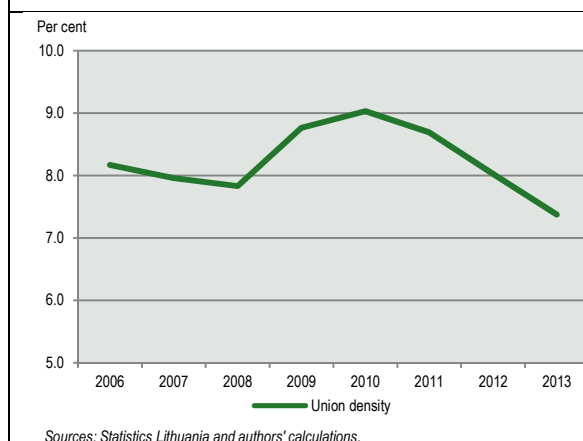
### **6.1 Labour market institutions: collective wage bargaining**

As noted above, the WDN3 survey collected firm-level data on the collective wage bargaining system in Lithuania: the type of collective wage bargaining agreements, the level of the economy at which such agreements are concluded, coverage of the system and frequency of the renewal of wage bargaining contracts. The interest in collecting such firm-specific data comes from economic theory stating that the specialities of the collective wage bargaining system might

exert pressure on wage growth in the economy, cause wage rigidity and, consequently, have adverse effects on demand for labour. This sub-section reviews the impact of the system on employment and presents some official statistics on union coverage in Lithuania.

High collective wage bargaining (or union) coverage and, consequently, the strong bargaining power of employees (along with trade unions) is considered to press wages up at a cost of lower employment, but in practice the effects of these aspects vary depending on coordination in the collective wage bargaining process in the economy. Higher coordination across the economy and labour market counterparts (employees, trade unions and employers' organisations) dampens excess wage claims and balances the negative effects of the former aspects. Wages can be bargained collectively at different levels of the economy. These could be set at the firm, industry or regional level, as well as in the economy as a whole. Wage bargaining, occurring only at the half-centralised or intermediate levels of the economy (i.e. industry and regional levels) leads to relatively high wages and, consequently, the worst employment outcomes.<sup>13</sup> If, on the other hand, wages are collectively bargained at the lowest or highest levels of the economy (i.e. at the firm and national levels), these strategies are regarded to be relatively employment-friendly.<sup>14</sup> Also in the economies where unions lack bargaining power, the level of unionisation is low and wages generally are not set collectively, the argument that institutional wage structure has an impact on unemployment, simply does not apply.<sup>15</sup>

Fig.23. Union coverage in Lithuania 2006–2013



Union density, usually serving as a proxy for collective wage bargaining system as a whole<sup>16</sup>, in accordance to official estimates covered around 7 per cent of economy in Lithuania in 2013 (see Fig. 23). Collective bargaining coverage is likely to be somewhat higher — around 15 per cent of all employees in economy were covered by collective agreements in 2009.<sup>17</sup> The official statistics thereby presents the view regarding this particular labour market institution that wages in Lithuania are bargained at individual level mainly — the level of economy which is considered to be employment-friendly.

## 6.2 Wage adjustments: collective wage bargaining

On top of this information, the WDN3 survey collected firm-level data on collective wage bargaining system in Lithuania. More precisely, it was investigated if Lithuanian firms are operating under any type of collective wage bargaining contracts, and, if so, whether these contracts are conducted at the firm level or higher levels of the economy (for instance industry, regional level or national levels). Also the WDN3 survey collected firm-level data on the renewal frequency of collective wage bargaining agreements, if such agreements are present. The results are presented in Tables 24, 25 and 26.

<sup>13</sup> The explanation is that wage determination, occurring on this level, is considered to be least coordinated and trade unions mind only a specific group of wage earners, thus negotiating wages above the market equilibrium level. This in turn leads to suppressed labour demand in specific sectors of the economy and an increase in unemployment rate.

<sup>14</sup> A decentralised or highly centralised wage determination process prevents excess wage claims and leads to the outcomes where wages are set at the level equal to or close to the market clearing level that would be achieved under perfect competition. In these wage bargaining processes such risks as decrease in labour demand, job destruction and increase in unemployment rate are taken into account when setting claims for wage growth. If wages are set on a firm level, labour market counterparts (employees, their local representatives and employers) are aware of the damaging effects of the excessive wage claims on firms' activity. Increase in the labour costs, deterioration of competitiveness and loss of the market shares to competitors would be such outcome that could alter demand for labour and lead to the job destruction. If wage bargaining is occurring at the highest level of the economy (i.e. national level), involvement of governments in the wage setting process dampens down excessive wage pressure. Awareness of the negative impact of the increase in labour costs on labour demand on the aggregate level is also taken into account in the wage setting process.

<sup>15</sup> Nickell 1997; Nickell *et al.*, 2002; Nickell *et al.*, 2005; Bassanini *et al.*, 2006; Baccaro *et al.*, 2007.

<sup>16</sup> Union density is calculated as a ratio between total union members and total number of employed in economy.

<sup>17</sup> EC estimates (<http://www.worker-participation.eu/National-Industrial-Relations/Countries/Lithuania/Collective-Bargaining>)

Table 24. Collective wage bargaining agreements at firm level in 2013; percentage of firms

	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
No, such an agreement does not exist	90.7	92.3	91.2	78.2	64.2	94.9	84.7	88.9	92.3	93.2
No, the agreement exists but the firm opted-out	1.0	0.8	1.2	1.9	4.5	0.0	2.1	0.9	1.0	1.9
Yes, such an agreement is in effect	8.4	7.0	7.7	19.9	31.3	5.1	13.3	10.2	6.6	4.9

Notes: firm-weighted shares.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table 25. Collective wage bargaining agreements outside the firm in 2013; percentage of firms

	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
No, such an agreement does not exist	98.5	99.0	97.7	94.7	100.0	98.9	95.0	98.2	99.7	100.0
No, the agreement exists but the firm opted-out	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0
Yes, such an agreement is in effect	1.3	0.7	2.3	5.3	0.0	1.1	5.0	1.1	0.3	0.0

Notes: firm-weighted shares.

Sources: Lithuanian WDN3 survey, authors' calculations.

In accordance with Tables 24–25, collective wage bargaining agreements are signed by around 10 per cent of Lithuanian firms on both the firm and other-than-firm level. This figure, in contrast to many EU economies, is very low. In 8.4 per cent of Lithuanian firms wage setting strategies are affected by collective wage bargaining agreements on the firm level, whereas such agreements conducted on higher levels are very rare — 1.3%. The shares of employees covered by these agreements are reported by Lithuanian firms to be even lower.<sup>18</sup> These facts would indicate that the labour market in Lithuania is operating to a high extent under individual-level wage bargaining regime and firm-level data is to a high extent in line with the figures provided by official statistics (see sub-section 6.1).

Coverage of collective wage bargaining agreements differ across sectors and especially across firm sizes, but, given relative unimportance of this labour market structural indicator, these differences are unlikely to have significant importance for economy as a whole. Nevertheless, firm size tends to correlate with coverage of bargaining agreements: larger companies are more likely to have a valid collective wage agreement signed on any level of economy as compared to the smaller ones. These larger firms though are operating in relatively different sectors in economy — construction and trade.

When one considers how often collective wage bargaining agreements typically change, an additional notable message emerges in analysing firm-level results from the WDN3 survey. The upper panel of Table 26 lists results on the frequency of the renewal of such contracts for all Lithuanian firms independently whether these have valid collective wage bargaining agreements on any level or not, whereas in the lower panel of the Table the results are conditioned on the fact that such agreements are in force. In accordance to these results, a big proportion of Lithuanian firms, even those having a valid agreement, chooses never to renew those (almost 40%); the other majority (almost 25%) renews those on low frequency, i.e. less frequently than once every two years. These considerations are important and lead to the additional implication that, in fact, a collective wage bargaining system in Lithuania is perhaps even lower than 10 per cent, as accounted by the results presented in Tables 24–25.

<sup>18</sup> More specifically, some Lithuanian firms reporting collective wage bargaining agreements being in effect indicate that no employees are covered by these agreements. Therefore the estimates from the WDN3 survey for the share of employees covered by the contracts are unreliable.



**Table 26. Frequency of renewals of collective wage bargaining agreements; percentage of firms (unconditioned)**

	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
More than one a year	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Once a year	4.1	4.4	1.2	6.8	0.8	1.6	2.4	4.4	5.4	1.1
Between one and two years	1.6	1.7	1.3	1.5	0.0	3.1	3.8	1.4	0.3	1.9
Every two years	2.4	1.9	1.0	8.3	13.4	1.1	4.1	1.6	3.1	3.0
Less frequently than once every two years	3.3	3.3	1.1	5.2	13.4	1.8	1.8	5.8	2.1	3.8
Never/Not applicable	88.7	88.7	95.4	78.2	72.4	92.4	87.9	86.8	89.1	90.1

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

(conditioned on that collective wage bargaining contracts on firm level are in effect)

	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
More than one a year	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Once a year	15.4	11.6	15.7	34.0	0.0	32.1	18.0	9.0	17.3	0.0
Between one and two years	4.1	4.4	0.0	7.4	0.0	0.0	0.0	6.8	4.4	0.0
Every two years	18.1	14.4	12.8	32.2	28.6	21.4	26.0	13.7	17.6	23.1
Less frequently than once every two years	24.6	29.6	12.8	14.8	28.6	16.7	9.2	29.2	31.9	0.0
Never/Not applicable	37.9	40.0	58.8	11.6	42.9	29.8	46.8	41.4	28.9	76.9

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

### 6.3 Real wage rigidity: adjustment of wages to inflation

The WDN3 survey collected information on the incidence of wage adjustment to inflation; such episodes in economic literature are known under the definition of downward real wage rigidity. More precisely, real wage rigidity refers to the lack of reductions of real wages, the situation occurring if nominal wages are indexed on the basis of an actual or expected inflation rate.<sup>19</sup> Analysis of such rigidities, as noted above, is important because wage flexibility is a crucial factor for firm activity in the presence of (especially) adverse economic shocks — it is a channel through which costs can quickly respond to the changing economic environment. The characteristics of wage dynamics are closely related to the frequency of wage adjustment, which is analysed more extensively onwards.

The incidence of wage adjustment to inflation could occur under various circumstances. Firstly, it could be related to the labour market institutions. In particular, empirical evidence suggests that higher collective bargaining coverage leads to higher real wage rigidity. This is mainly associated with the fact that wage indexation to inflation rules are implemented by wage bargaining contracts. There is also evidence that bargaining contracts conducted at firm-level tend to increase rigidity more than if these are signed on higher levels of economy.<sup>20</sup> Secondly, wage indexation rules could be enacted by national laws, also causing rigid real wages. Thirdly, even if wages are bargained on an individual level, stricter EPL (see sub-section 5.1) increases the bargaining power of employees and might exert pressure on the incidence of wage indexation. The extent of real wage rigidity is found also to depend on the composition of the labour force; labour-intensive production sectors are likely to have more rigid wages.<sup>21</sup>

At the top of the theoretical overview, the WDN3 survey results, provided in Table 27, show that there could be signs of real wage rigidity in Lithuania. More than half of the firms reported that they adjusted wages to inflation in the periods before 2008, in 2008–2009 and in 2010–2013 (67.2%, 55.5% and 69.9% respectively). The proportion of firms adjusting wages to inflation differ depending on the period — in the periods of economic upturns the shares of such firms tended to be higher than in downturns, signalling the asymmetrical behaviour of Lithuanian firms during different phases of the business cycle. Although analysis of the source of rigidity is outside the scope of this paper, it is noteworthy that there is no legal framework that obliges Lithuanian firms to adjust wages to inflation; also, the collective wage bargaining system is low (see sub-sections 6.1 and 6.2), therefore cyclical factors (under current EPL as well as other factors) could matter the most for such trends. Those firms that did not index wages to inflation usually indicated that such practices are not applied because there are no legal obligations for wage adjustments (over 80% in all periods).<sup>22</sup>

<sup>19</sup> Babecky *et al.*, 2009.

<sup>20</sup> *Ibid.*

<sup>21</sup> *Ibid.*

<sup>22</sup> Interestingly, the results, presented in Table 27, point towards rather high real wage rigidity in Lithuania: more than a half of Lithuanian firms tend to adjust wages to inflation. These results might be considered to contradict findings reported in Section 4 (see sub-section 4.6) where the preliminary conclusion was drawn on a rather high degree of the flexibility of the Lithuanian labour market. It is, however, noteworthy that the question on wage adjustments to inflation in the WDN3 survey was formulated in an essentially qualitative way, i.e. with no indication on the equality between the inflation rate and the intensity of wage adjustment, and the results thereby might be biased. If Lithuanian firms tend to increase nominal wages at a lower rate than inflation, that would indicate decrease in real wages and lead to considerably lower real wage rigidity figures than accounted by results reported in Table 27.

In analysing divergences across sectors, indeed, a higher fraction of the firms within labour-intensive production sectors, especially business services and financial intermediation — tended to adjust wages to inflation as compared to the manufacturing — capital-intensive — sector, but only in the periods before 2008 and in 2008–2009. No clear divergence pattern across firm size bins are observed in any period considered by the WDN3 survey.

Table 27. Incidence of base wages adjustment to inflation; percentage of firms

Before 2008										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Yes	67.2	66.7	69.6	65.6	72.1	61.0	66.8	67.0	70.6	75.3
No:	32.8	33.3	30.4	34.4	27.9	39.0	33.2	33.0	29.4	24.8
if No: inflation was too low so that indexation rules were non-operative										
	18.8	19.9	23.8	2.7	16.7	31.3	11.6	11.2	22.4	0.0
if No: there are no legal or other types of indexation rules specifying such an adjustment										
	81.2	80.1	76.2	97.3	83.3	68.7	88.4	88.8	77.6	100.0
During 2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Yes	55.5	53.8	63.7	57.0	44.2	51.5	41.4	53.0	62.5	66.4
No:	44.5	46.3	36.3	43.0	55.8	48.6	58.6	47.1	37.5	33.6
if No: inflation was too low so that indexation rules were non-operative										
	10.6	9.7	17.1	5.7	0.0	0.0	16.3	13.4	10.4	5.8
if No: there are no legal or other types of indexation rules specifying such an adjustment										
	89.4	90.3	82.9	94.3	100.0	100.0	83.7	86.6	89.6	94.2
During 2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Yes	69.9	69.9	70.4	69.2	68.5	71.5	73.4	67.0	70.6	72.9
No:	30.1	30.1	29.6	30.8	31.5	28.5	25.6	33.0	29.4	27.1
if No: inflation was too low so that indexation rules were non-operative										
	14.7	15.1	17.6	8.6	0.0	2.2	17.3	14.9	17.9	0.0
if No: there are no legal or other types of indexation rules specifying such an adjustment										
	85.3	84.9	82.5	91.4	100.0	97.8	82.7	85.1	82.1	100.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

## 6.4 Frequency of base wage changes

Valuable information over the frequency of base changes was also collected by the WDN3 survey. This is another perspective to understanding how wages in Lithuania are determined, set and adjusted. At least several features of this labour market indicator could be listed to show its relative importance. Firstly, the frequency of wage adjustment is straightforwardly associated with the degree of wage flexibility in the economy — a higher frequency of wage adjustment implies more flexible wages. It should also be noted here that the collective wage bargaining system usually plays a significant role in determining frequency<sup>23</sup>, but as its coverage is very low in Lithuania (see sub-sections 6.1–6.2), other factors should matter for the results. Secondly, frequency of wage adjustment is also relevant in analysis of the price-setting behaviour of firms; in particular, it might provide insights about how firms choose to adjust prices in relation to the evolution of labour costs. Frequency of base wage changes thereby could be directly linked to price change frequency in order to identify which variable — wages or prices — is more rigid in Lithuania. Table 28 lists the answers of the firms over the most popular wage change frequencies in Lithuania in the periods before 2008, in 2008–2009 and 2010–2013.

Distribution of firms in terms of base wage change frequencies was concentrated in the three main intervals: wages changed once a year, between one and two years and less frequently than once every two years.<sup>24</sup> Heterogeneity although usually not straightforward, was present across the analysed periods. The share of Lithuanian firms adjusting base wages once a year (21.7%–25.0%) and between one and two years (17.8%–21.7%) was rather stable in all the periods under consideration, whereas the fraction of the firms reporting wage changes less frequently than once every two years was gradually declining (from 17.7% in the period before 2008 to 12.5% in 2010–2013). Wage adjustment was moreover concentrated in the higher frequency tail of the distribution — this is an indication of relatively low wage rigidity in Lithuania. The share of firms adjusting wages at higher frequencies rises over time, which points to increasing wage flexibility.<sup>25</sup>

Analysing divergences across sectors, it is noteworthy that wage change frequencies tend to be higher in manufacturing and construction sectors, but lower in trade, featuring more flexible wage setting in the former sectors, quicker wage adjustment to the changing economic environment and lower wage rigidity. There are no clear patterns in divergences

<sup>23</sup> Druant *et al.*, 2009.

<sup>24</sup> The option "Never/Not applicable" is chosen usually not to be commented to a high extent because of the difficulties of interpretation.

<sup>25</sup> In particular, the share of firms in the high wage change frequency interval (more than once a year and once a year) was 31.4 per cent in the period before 2008 and increased to 34.7 per cent in 2010–2013, with a somewhat lower share (29.3%) during the crisis in 2008–2009. If wage adjustment occurring between one and two years was also assigned a high frequency, the tendencies of movements towards higher frequencies are even more profound. The share of the firms reporting low frequencies of base wage adjustment (i.e. every two years and less frequently than once every two years) declined from 26.6 per cent in the period before 2008 to 22.2 per cent in 2010–2013.

across different firm sizes, although large firms tended to report somewhat higher wage flexibility in comparison to the other size bins.

Table 28. Frequency of base wage change; percentage of firms

Before 2008										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
More than once a year	9.4	9.5	6.2	15.4	4.9	14.1	14.4	8.5	6.7	9.3
Once a year	22.0	21.5	22.9	25.6	15.6	21.7	14.1	18.8	26.8	15.5
Between one and two years	17.8	16.1	26.4	12.9	19.7	26.2	20.6	17.5	13.7	9.3
Every two years	9.0	8.4	9.4	13.3	4.9	8.8	16.5	5.2	10.4	14.2
Less frequently than once every two years	17.7	19.0	15.4	10.7	26.2	7.5	8.1	24.4	18.8	21.0
Never/Not applicable	24.3	25.6	19.8	22.1	28.7	21.7	26.3	25.7	23.6	30.9
During 2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
More than once a year	7.6	6.5	7.1	17.6	4.9	10.0	13.9	5.6	6.7	9.6
Once a year	21.7	21.1	24.0	23.6	10.7	21.7	19.1	20.3	23.4	22.6
Between one and two years	21.7	21.8	26.5	13.3	15.6	34.1	22.6	17.8	19.7	12.5
Every two years	7.1	7.6	4.7	8.2	4.9	8.1	10.9	6.6	6.4	2.4
Less frequently than once every two years	13.6	13.4	14.6	11.9	16.4	5.1	6.5	18.3	14.9	13.9
Never/Not applicable	28.3	29.5	23.1	25.5	47.5	21.0	27.1	31.4	29.0	38.9
During 2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
More than once a year	9.8	9.7	7.6	15.6	9.0	9.8	20.5	6.2	9.3	14.4
Once a year	25.0	25.9	22.9	22.0	14.9	19.8	20.3	26.3	27.6	25.5
Between one and two years	21.2	20.9	22.8	22.2	13.4	39.4	18.0	18.8	16.6	13.7
Every two years	9.7	10.5	7.7	5.4	9.0	3.7	10.0	9.8	12.2	7.6
Less frequently than once every two years	12.5	11.3	16.0	14.3	27.6	12.1	8.3	15.4	11.5	10.3
Never/Not applicable	21.9	21.7	23.0	20.5	26.1	15.2	22.8	23.5	22.8	31.6

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

## 6.5 Wage rigidity: incidence of wage cut and wage freeze

The incidence of nominal wage cut and freeze might provide additional information about wage rigidity. This issue was thereby also covered by the WDN3 survey, in particular, by asking Lithuanian firms to indicate whether such measures as wage cuts or freezes were applied at any point of time during 2008–2013. In economic literature the ability to cut nominal wages is usually related to wage flexibility, whereas wages freeze — to downward wage rigidity. Nominal wage rigidity, similar to real wage rigidity, is associated with the fact that wages never decrease in nominal terms, the situation occurring under the episodes of wages freeze. The reasons for rigid nominal wages are very much the same as for real wage rigidity (see sub-section 6.3).<sup>26</sup> The summary of the results of Lithuanian firms that applied wage cut and wage freeze measures are presented in Table 29.

Results show that although wage freeze measures were applied more extensively every year between 2008 and 2013, incidences on wage cuts were not very rare in Lithuania. The distribution of the firms applying wage freeze measures was very equal (between 24.5%–28.7%) in the initial phase of the crisis in 2008, at its peak in 2009 and in the early phase of economic recovery in 2010–2011, but declined in 2012–2013 (22.3% in 2012 and 19.7% in 2013). Wage cut measures were on the other hand extensively used by a high share of Lithuanian firms only at the peak of economic crisis in 2008–2009 (11.2% in 2008 and 21.7% in 2009) and declined significantly in the years thereafter. The overall conclusion from these results would be that nominal wage rigidity is partially present in Lithuania; it is accounted by higher share of firms choosing to apply wage freeze, not wage cut, measures, although even the incidence of wage cut is noticeable. In addition, the results reported on the wage cut incidences are to a high extent consistent with official statistics, reporting nominal wage decrease in the 2009–2010 (see Section 3).

Divergences across firm size bins are sizable: large and very large firms tended to react quicker to the worsening economic conditions by applying wage cut measures. The share of these firms applying this particular measure was also much higher than the average in 2008 and 2009. This could be again associated with the fact that exposure of the larger firms to the negative shocks was reported to be higher as compared to the other firm sizes, although adverse shocks were considered mainly to be of temporary nature (see sub-sections 4.1–4.2). In regard to wage freeze measures, no

<sup>26</sup> Babecky et al., 2009.

clear pattern in divergences across different firm sizes could be observed, but divergences across sectors are present considering both wage cut and wage freeze incidences. Higher shares of the firms operating in the manufacturing and construction sectors reported wage cut measures in 2009 (also to some extent in 2010) than the average (28.7% and 28.8% respectively), whereas wage freeze measures were broader than the average used in the construction sector at any point of time between 2009 and 2013. Interestingly, this sector of the economy reported extensively the incidence of wage freeze even in 2012 and 2013 which could be related to weak recovery patterns in the after-crisis period (see also Section 3 and sub-section 4.1).

**Table 29. Incidence of wage cut and wage freeze; percentage of firms**

	Economy (total)			Small			Medium			Large			Very large		
	Frozen	Cut	Neither frozen nor cut	Frozen	Cut	Neither frozen nor cut	Frozen	Cut	Neither frozen nor cut	Frozen	Cut	Neither frozen nor cut	Frozen	Cut	Neither frozen nor cut
<b>2008</b>	24.5	11.2	66.3	26.3	11.1	64.7	17.2	7.5	76.6	28.6	18.5	56.7	10.7	15.6	74.6
<b>2009</b>	27.7	21.7	55.0	27.1	21.6	55.4	25.5	15.9	60.9	36.2	33.6	39.4	30.3	21.3	58.2
<b>2010</b>	28.7	8.1	65.2	28.0	9.0	64.9	24.9	4.8	72.7	42.8	7.5	53.0	32.0	5.5	62.5
<b>2011</b>	28.4	4.0	69.8	31.2	4.5	66.8	15.4	2.1	83.6	29.1	4.5	69.7	26.1	0.0	73.9
<b>2012</b>	22.3	3.7	75.6	24.5	3.9	73.4	11.8	3.2	86.0	21.8	2.3	76.7	21.6	4.5	73.9
<b>2013</b>	19.7	4.2	77.9	20.9	4.7	76.0	12.7	2.2	87.3	22.8	3.5	75.8	12.7	0.0	87.3
	Manufacturing			Construction			Trade			Business services			Financial intermediation		
	Frozen	Cut	Neither frozen nor cut	Frozen	Cut	Neither frozen nor cut	Frozen	Cut	Neither frozen nor cut	Frozen	Cut	Neither frozen nor cut	Frozen	Cut	Neither frozen nor cut
<b>2008</b>	30.4	11.1	60.6	27.5	11.7	60.8	18.4	8.7	75.1	26.7	13.2	62.6	17.8	11.4	72.4
<b>2009</b>	28.7	28.7	48.3	32.1	28.8	39.1	25.8	20.4	59.1	28.0	18.1	58.0	22.1	16.0	62.0
<b>2010</b>	26.6	11.7	61.8	36.9	11.5	53.7	24.8	5.3	71.1	31.2	8.3	64.1	22.9	5.8	71.3
<b>2011</b>	35.0	6.8	61.6	33.4	0.8	65.8	22.4	1.9	76.8	29.9	5.8	67.9	19.3	3.4	77.3
<b>2012</b>	25.9	3.3	70.9	35.9	6.8	60.0	17.6	1.6	82.4	20.8	4.8	76.5	18.6	3.9	77.5
<b>2013</b>	18.3	3.7	78.5	33.3	8.6	64.4	14.6	0.9	84.7	20.3	5.8	76.1	18.3	3.8	78.0

Notes: firm-weighted averages; multiple measures for the same period are allowed.

Sources: Lithuanian WDN3 survey, authors' calculations.

## 6.6 Wage rigidity: the impact of the labour market institutions on wage adjustment

The incidence of wage cuts during the crisis points towards a quite high degree of wage flexibility in the Lithuanian labour market. To extend analysis on the topic, it is investigated how labour market institutions, in particular collective wage bargaining system, influences the decisions of firms. It is examined if the firms, covered by collective wage bargaining agreements on the firm level, tend to exhibit a higher degree of wage rigidity as compared to the remaining ones. Two survey indicators — evolution of base wages and wage indexation to inflation — are investigated in order to answer this question. Firm-level evidence is presented in Tables 30–31, where the results are conditioning on the presence and absence of collective agreements on the firm level. Given very low coverage on the system (see sub-section 6.1), these results should be treated with high degree of caution.

The results reported in Table 30 suggest that, on the aggregate level, the evolution of the base wages under valid collective wage bargaining agreements does not differ much in trends as compared to the remaining firms. There are some indications that the firms bound to this labour market institution less often tended to reduce (strongly and moderately) base wages in the period of 2008–2009, but differences are quite small. These results suggest that a rise in the coverage of the system and bargaining power of employees could lead towards higher wage rigidity in the periods of the economic crisis. Conversely, there is no direct indication that valid wage bargaining agreements put pressure on wage growth (both strongly and moderately) in economic upturns. This accounted by similar base wage development patterns in 2010–2013 under the presence and absence of collective agreements. That possibly signals asymmetry in the behaviour of the firms, depending on the state of the business cycle. In particular, collective bargaining might lead to more wage rigidity if wages are intended to be reduced, but puts no pressure for the wage growth above the average rate. Analysing differences across sectors and firm size bins tendencies are a very trivial divergent. The firms that were more often bound to collective agreements, i.e. larger firms and firms operating in the construction and trade sectors (see sub-section 6.2), did not necessarily tend to decrease base wages in the crisis period less often than the remaining

ones, but these trends are sector dependent. The construction sector less often reported a decrease in base wages under collective agreements in 2008–2009, which was not the case for trade.

Table 30. Evolution of base wages under valid (firm level) wage bargaining agreements; percentage of firms

2008–2009																				
	Economy (total)		Small		Medium		Large		Very large		Manufacturing		Construction		Trade		Business services		Financial intermediation	
	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement
Strong decrease	6.2	6.3	4.1	5.5	10.3	0.0	12.2	14.9	26.8	0.0	5.8	0.0	17.2	0.0	3.1	7.9	6.5	8.7	7.8	0.0
Moderate decrease	28.7	24.7	30.3	24.5	22.2	33.6	29.5	15.8	30.3	35.9	32.9	9.2	26.0	0.0	27.8	34.2	28.7	26.2	13.4	60.1
Unchanged	43.1	47.7	43.6	55.5	43.2	33.6	40.4	38.9	34.8	33.2	46.2	55.7	36.2	51.0	47.6	55.8	39.0	34.6	62.9	39.9
Moderate increase	21.2	21.4	21.4	14.6	23.1	32.9	16.6	30.4	8.1	30.9	15.2	35.1	19.4	49.0	21.5	2.1	24.2	30.5	13.3	0.0
Strong increase	0.8	0.0	0.7	0.0	1.2	0.0	1.4	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	1.7	0.0	2.6	0.0

2010–2013																				
	Economy (total)		Small		Medium		Large		Very large		Manufacturing		Construction		Trade		Business services		Financial intermediation	
	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement
Strong decrease	3.1	2.8	3.3	4.4	2.1	0.0	2.8	0.0	6.5	0.0	1.0	0.0	3.5	0.0	1.6	6.8	5.4	0.0	0.0	0.0
Moderate decrease	5.7	9.6	6.4	10.4	1.3	0.0	9.4	12.7	0.0	14.1	7.2	8.4	5.8	4.6	4.2	6.8	6.4	17.2	6.2	0.0
Unchanged	26.4	28.0	27.4	23.5	21.1	43.9	29.8	40.6	13.1	0.0	18.7	21.3	32.3	4.6	23.4	41.7	30.3	27.7	36.0	0.0
Moderate increase	59.0	52.4	57.8	56.1	67.5	43.2	49.6	35.0	73.9	85.9	66.5	70.3	54.0	72.8	66.6	42.8	50.8	44.7	53.9	100.0
Strong increase	5.7	7.4	5.1	5.6	8.0	12.9	8.4	11.6	6.5	0.0	6.6	0.0	4.4	17.9	4.3	1.8	7.1	10.5	3.9	0.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Analysing the incidence of wage adjustment to inflation in the presence of the valid collective wage bargaining agreement, with the results reported in Table 31, some tendencies differ. The firms covered by agreements more often adjusted wages to inflation (over 80%) than the remaining ones (over 50%) in 2008–2009; this is an indication of higher real wage rigidity under this labour market institution and these trends were present for all the sectors and firms size bins of economy. On an aggregate level, the tendencies in 2010–2013 are rather similar, but divergences between the firms covered and not covered by agreements are much smaller. In good times, a much higher share of the firms (almost 70%), despite absence of collective wage bargaining agreements, adjust wages to inflation anyway. Contradicting somewhat previous findings (i.e. that this labour market institution does not exert additional pressure on wage growth in good times)<sup>27</sup>, the period of 2010–2013 is also characterised by a higher share of firms adjusting wages to inflation under collective wage bargaining agreements as compared to the remaining ones. These results point towards the conclusion that rigid real wages are more likely to be present under this labour market institution, but low coverage of the system should yield a small effect on the aggregate level.

Table 31. Incidence of base wages adjustment to inflation under valid (firm level) wage bargaining agreements; percentage of firms

During 2008–2009																				
	Economy (total)		Small		Medium		Large		Very large		Manufacturing		Construction		Trade		Business services		Financial intermediation	
	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement
Yes	53.0	80.3	51.1	82.6	61.6	100.0	53.8	70.0	42.0	50.1	48.7	89.6	35.0	100.0	49.0	82.1	62.1	67.8	61.2	100.0
No	47.0	19.7	48.9	17.5	38.4	0.0	46.2	30.1	58.0	49.9	51.3	10.4	65.1	0.0	51.0	17.9	37.9	32.2	38.8	0.0

During 2010–2013																				
	Economy (total)		Small		Medium		Large		Very large		Manufacturing		Construction		Trade		Business services		Financial intermediation	
	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement	no valid agreement	with valid agreement
Yes	68.4	86.9	68.1	92.0	68.9	100.0	69.7	67.2	72.4	60.0	70.3	90.6	69.5	100.0	64.1	92.1	70.8	67.8	70.1	100.0
No	31.6	13.2	31.9	8.0	31.1	0.0	30.3	32.8	27.6	40.0	29.8	9.4	30.5	0.0	35.9	7.9	29.2	32.2	29.9	0.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

## 6.7 Wage rigidity: the impact of wage rigidity on recovery patterns in after-crisis period

Economic theory suggests that wage rigidity or overall labour market inflexibility leads to failures the labour market to adjust to negative economic shocks during periods of crisis and might lead to protracted recovery afterwards.<sup>28</sup> One of the reasons for the rather quick recovery of the Lithuanian economy from the crisis could, therefore, be internal devaluation that occurred in 2008–2009 (see Section 3, sub-sections 4.4–4.6 and 6.4–6.5). Flexibility of the labour market is, however, an essential condition for internal devaluation to take place. These issues are more extensively investigated in Lithuanian data, examining whether those firms that underwent internal devaluation in 2008–2009 showed a quicker recovery pattern in the after-crisis period of 2010–2013. This hypothesis is investigated in several ways and the results presented in Tables 32–34 yield mixed results.

<sup>27</sup> However, it might simply be associated with special clauses in collective agreements in Lithuania, obliging employers to adjust wages to inflation with no other formal requirement for wage growth patterns.

<sup>28</sup> Blanchard and Wolfers, 2000.

Table 32 presents a perception of Lithuanian firms over demand shock in 2010–2013, given (strong and moderate) decrease in demand in 2008–2009 and conditioning results on two types of firms: the ones that responded to demand shock in 2008–2009 by (strongly and moderately) reducing base wages in the same period and the ones that reported base wages being unchanged. Firm-level results suggest that there are clear signs that the firms which experienced base wages cuts in 2008–2009 under negative demand shock showed quicker recovery patterns in the period afterwards. This is accounted by a higher share of firms (almost 60%) reporting, after internal devaluation, an increase in demand for their products and services in 2010–2013 as compared to a lower fraction of the remaining ones (less than 50%). These patterns apply for almost all the sectors of economy and across all size bins. Although a positive demand shock could occur not only because of internal devaluation and enhanced competitiveness, but also due to external factors, these results anyway are sufficiently informative.

Table 32. Demand shock in 2010–2013 under different base wage adjustment strategies in 2008–2009; percentage of firms

	2010–2013																			
	Economy (total)		Small		Medium		Large		Very large		Manufacturing		Construction		Trade		Business services		Financial intermediation	
	no base wage decrease in 2008–2009	with base wage decrease in 2008–2009	no base wage decrease in 2008–2009	with base wage decrease in 2008–2009	no base wage decrease in 2008–2009	with base wage decrease in 2008–2009	no base wage decrease in 2008–2009	with base wage decrease in 2008–2009	no base wage decrease in 2008–2009	with base wage decrease in 2008–2009	no base wage decrease in 2008–2009	with base wage decrease in 2008–2009	no base wage decrease in 2008–2009	with base wage decrease in 2008–2009	no base wage decrease in 2008–2009	with base wage decrease in 2008–2009	no base wage decrease in 2008–2009	with base wage decrease in 2008–2009	no base wage decrease in 2008–2009	with base wage decrease in 2008–2009
Strong decrease	9.4	5.5	11.1	7.1	0.0	0.0	15.0	2.7	0.0	10.6	19.8	1.7	15.1	0.0	3.3	7.0	11.2	7.0	0.0	13.0
Moderate decrease	25.0	17.4	23.5	18.7	25.6	16.4	32.4	9.2	40.6	21.3	13.7	12.6	24.4	25.9	31.7	8.1	22.0	25.2	27.0	20.3
Unchanged	18.1	18.8	17.4	21.5	25.6	8.0	9.8	20.5	20.0	14.3	2.7	19.1	24.4	0.0	25.1	22.5	13.9	20.1	34.8	13.1
Moderate increase	42.8	50.8	41.5	44.5	48.8	71.2	42.9	57.4	39.5	53.7	43.9	49.8	16.8	65.7	40.0	55.3	53.0	44.1	38.2	40.7
Strong increase	4.7	7.6	6.5	8.3	0.0	4.5	0.0	10.3	0.0	0.0	19.8	16.9	19.4	8.4	0.0	7.0	0.0	3.5	0.0	13.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Analysing development of number of permanent employees in the after-crisis period, results are divergent and sector dependent — there are no clear signs that internal devaluation led to quicker employment recovery. Table 33 reports results.<sup>29</sup> Firm-level evidence suggest that less than half (around 40%) of Lithuanian firms increased in number of permanent employees in the presence on positive demand shock in 2010–2013 independently whether labour costs were adjusted or not in response to adverse demand changes in 2008–2009. These results are disappointing as no clear overall conclusion could be drawn so far about the effect of labour market rigidities on the recovery patterns of Lithuanian firms.

Table 33. Evolution of number of permanent employees in 2010–2013 under different labour cost adjustment strategies in 2008–2009; percentage of firms

	2010–2013																			
	Economy (total)		Small		Medium		Large		Very large		Manufacturing		Construction		Trade		Business services		Financial intermediation	
	no labour cost decrease in 2008–2009	with labour cost decrease in 2008–2009	no labour cost decrease in 2008–2009	with labour cost decrease in 2008–2009	no labour cost decrease in 2008–2009	with labour cost decrease in 2008–2009	no labour cost decrease in 2008–2009	with labour cost decrease in 2008–2009	no labour cost decrease in 2008–2009	with labour cost decrease in 2008–2009	no labour cost decrease in 2008–2009	with labour cost decrease in 2008–2009	no labour cost decrease in 2008–2009	with labour cost decrease in 2008–2009	no labour cost decrease in 2008–2009	with labour cost decrease in 2008–2009	no labour cost decrease in 2008–2009	with labour cost decrease in 2008–2009	no labour cost decrease in 2008–2009	with labour cost decrease in 2008–2009
Strong decrease	0.0	1.8	0.0	0.0	0.0	4.6	0.0	5.4	NA	0.0	0.0	4.7	0.0	0.0	0.0	0.0	0.0	4.2	0.0	0.0
Moderate decrease	3.8	11.0	4.3	13.9	2.4	5.6	0.0	7.4	NA	14.7	0.0	27.3	0.0	0.0	20.9	7.0	0.0	13.7	22.7	25.8
Unchanged	53.3	47.1	63.6	51.5	0.0	38.2	26.9	40.3	NA	58.6	66.7	26.3	0.0	37.5	41.8	61.1	60.7	39.2	25.8	48.4
Moderate increase	35.6	34.2	26.5	30.5	76.0	40.7	73.1	41.5	NA	26.8	33.3	27.4	13.9	51.1	37.4	31.9	39.3	34.2	51.5	25.8
Strong increase	7.3	5.8	5.6	4.2	21.6	11.0	0.0	5.4	NA	0.0	0.0	14.2	86.1	11.4	0.0	0.0	0.0	8.8	0.0	0.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

## 6.8 Labour cost share and share of bonuses to labour costs

Additional variables that were considered by the WDN3 survey were the share of the labour costs to total costs and the share of bonuses and benefits to labour costs. The importance of these variables could be described by their relevance for firms' behaviour — these tend to impact a vast majority of variables considered by the WDN3 survey. For instance, labour cost share and especially share of bonuses to the labour costs are found in the economical literature to be of importance for frequency of wage and, consequently, price adjustment. Also higher share of bonuses to labour costs allows quicker response of labour and total cost to the shocks, especially if these are not bounded to strictness of employment protection or even collective wage bargaining system in economy. It is also a well-known fact that such sectors of the economy as services and construction tend to be more labour-intense than manufacturing sector, therefore they are represented by higher labour cost shares. These features can help to explain divergences of labour cost dynamic across sectors as these are more relevant in the labour-intense sectors of economy.

Table 34 reports the average labour cost share of Lithuanian firms along with the share of bonuses to total labour costs. In accordance to the WDN3 survey results, the average labour cost share in Lithuania turned out to be 39.8 per cent

<sup>29</sup> Again, Table 33 reports results for two types of the firms: the firms that experienced a positive demand shock in 2010–2013, given (strong and moderate) decrease in demand in 2008–2009 and accordingly adjusted labour costs in 2008–2009 to the ones that did not employed cost cut strategies under same economic conditions.

whereas share of bonuses to labour costs — 11.7 per cent. The share of labour costs to total costs tends to be higher than the average in small firms (around 40%) and lower than the average in large firms. Capital-intensive production sectors, such as manufacturing, expectedly reported lowest share (almost 36%) of labour costs as compared to the other — labour-intensive — sectors of economy. In regard to bonuses, there is no clear pattern across sectors and different sizes of the firms, although it turns out to be the lowest in small firms (over 10%) and the highest in the construction sector (over 15%), signalling possibly that these usually are not performance-related.<sup>30</sup>

Table 34. Share of labour costs to total costs and share of bonuses to labour costs in 2013; in per cent

	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Share of labour costs to total costs, percent	39.8	40.5	38.7	36.4	32.9	35.5	39.3	37.1	44.2	48.1
Share of bonuses and benefits to labour costs, percent	11.7	10.7	15.4	14.1	13.4	13.0	15.9	10.8	10.5	10.9

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

## 6.9 Labour costs of newly hired

The WDN3 survey also engaged in gathering firm-level data on the costs of newly hired employees. In particular, the question that Lithuanian firms were asked to answer was how labour costs of a newly hired worker compared with that of a similar incumbent worker (in terms of experience and task assignment). The relevance of this variable in the analysis of behaviour of the firms arises from theoretical framework suggesting that, in general, the ability to adjust pay scales for newly hired workers is associated with new job creation and greater wage flexibility in the economy. Equally, restraints for the pay scale adjustment lead to wage rigidity and labour force corrections in the presence of adverse economic shocks (given that labour costs form an important fraction of total costs). Empirical evidence investigating reasons for higher alternatively lower wage flexibility states that the incidence of lower pay scales for newly hired workers is to a high degree dependent on labour market institutional, in particular collective wage bargaining, structure. If collective wage bargaining practices in the economy are common, wages for newly hired are likely to be similar to existing incumbent employees. Separate scales for new hires correlate, however, strongly with the composition of the labour force, firm and product market characteristics.<sup>31</sup>

The incidence of different pay scales for newly hired in Lithuania was investigated by the WDN3 survey with results listed in Table 35. The periods covered by the survey involved the period before 2008 as well as the periods of 2008–2009 and 2010–2013. Firm-level results reveal that the direction of different pay scales for newly hired employees varies very much depending on the period considered, but the share of firms reporting equal conditions for newly hired, as compared to the incumbent, is quite similar: more than half (60.5%–65.8%) of Lithuanian firms persuade the latter employment strategies. The highest share (over 26%) of firms reporting lower (accounting for both lower and much lower) labour costs for newly hired workers was in the period of the economic crisis in 2008–2009. Consequently, this period was also characterised by the lowest share (around 8%) of firms reporting higher (accounting for both higher and much higher) labour costs for newly hired. The opposite situation occurred in the period of economic recovery — in 2010–2013 a high share (almost 25%) of Lithuanian firms indicated higher labour costs and a low share (almost 15%) — lower labour costs for the newly hired.<sup>32</sup> These results suggest thereby that, under the individual-level bargaining regime (see sub-section 6.2), behaviour of this labour market indicator exerts a high degree of cyclical dependency and covariates strongly with the state of business cycle. Importance of other factors that determine whether firms choose to offer different pay scales for newly hired as compared to incumbent employees are not considered explicitly by the Lithuanian WDN3 survey, but one of the reasons for higher or lower wages could be the shortage and excess of labour with required skills (see also sub-section 5.6) in the periods of economic upturns and downturns respectively.

There are considerable differences across firm sizes and sectors. The manufacturing sector tended more often to report lower labour costs for newly hired, as compared to the incumbent employees, than the remaining sectors of the economy. This is valid for all the periods considered: before 2008, in 2008–2009 and in 2010–2013. The most plausible explanation for such trends is the composition of the labour force (see Section 6.2) which, in manufacturing, is

<sup>30</sup> To be more precise, it could be not individual, but sector performance oriented.

<sup>31</sup> Galuscak et al, 2010.

<sup>32</sup> Results show that in the period of 2008–2009 lower pays for newly hired workers did not increase much compared to the period before 2008. Also, in comparing the reported results for 2010–2013 to the period before 2008, the share of firms paying higher wages for newly hired workers was considerable only in 2010–2013. As the period before 2008 was characterised by overheating (see Section 3), these tendencies are unexpected, it could not be attributable to labour market institutions are difficult to explain.

characterised by the highest share of a lower skilled labour force. No clear pattern regarding divergences across firm size bins could be observed from the WDN3 data in Lithuania.

Table 35. Labour costs of a newly hired workers; percentage of firms

Before 2008										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Much lower	3.2	2.9	3.8	4.3	4.9	4.7	4.8	2.0	3.3	0.0
Lower	21.9	21.0	26.0	21.0	18.0	34.7	10.5	21.8	18.7	15.4
Similar	64.4	67.7	54.1	58.0	76.2	54.4	73.7	69.7	62.1	77.8
Higher	9.4	7.7	13.6	14.9	0.8	6.1	8.2	6.0	14.2	3.7
Much higher	1.1	0.7	2.5	1.9	0.0	0.0	2.9	0.5	1.7	3.1
During 2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Much lower	2.5	1.8	3.7	4.7	9.8	3.7	3.6	3.8	0.6	7.2
Lower	24.0	21.1	30.3	38.4	8.2	28.9	18.9	21.5	25.4	16.4
Similar	65.8	70.1	53.1	53.2	82.0	61.7	70.1	70.3	62.7	65.4
Higher	6.3	5.6	11.8	2.9	0.0	5.6	7.5	3.3	8.8	11.1
Much higher	1.4	1.5	1.1	0.9	0.0	0.0	0.0	1.1	2.5	0.0
During 2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Much lower	1.7	2.1	0.0	0.0	4.5	0.4	0.0	2.8	1.7	3.8
Lower	13.2	12.0	18.6	15.6	8.2	21.7	10.1	11.4	12.1	15.2
Similar	60.5	63.7	46.0	57.3	63.4	63.2	60.0	63.4	57.1	57.0
Higher	20.0	18.7	24.9	22.9	19.4	13.6	25.5	19.3	21.7	16.4
Much higher	4.6	3.5	10.5	4.2	4.5	1.1	4.4	3.2	7.4	7.6

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

## 7. WDN3 survey results: price setting and price changes

This paper further explores the WDN3 survey data and analyses price-setting behaviour of Lithuanian firms. In particular, this section starts by presenting the survey-based evidence on price-setting strategies of Lithuanian firms (sub-section 7.1). This particular indicator initiates discussion about the most common price-setting strategies in search for the answer to whether Lithuanian firms are price-takers or price-setters. Understanding that is meaningful, as flexible price-setting strategies allow quicker price adjustment in response to development of total and labour costs. For price-takers, adjustment of prices towards evolution of the costs would, in turn, be rather limited. Price-setting strategies could thereby help understand differences in the frequency of price changes (sub-section 7.2). Although this linkage is not analysed in this paper, frequency in price adjustment is discussed in parallel to base wage changes in order to find a possible relation between these indicators.

### 7.1 Price setting strategies of Lithuanian firms

The WDN3 survey collected firm-level data on the most common price-setting practices of Lithuanian firms on domestic and foreign markets in 2013. As the relevance of this information is to identify whether Lithuanian firms are price-takers or price-setters, several pre-determined alternatives for the answers, such as that prices are regulated, set by parent company, set by main customers and followed by the main competitors, could be straightforwardly linked to the price-taking behaviour of the firms. If price-setting strategies are, on the other hand, cost driven or negotiated individually (i.e. it should still be associated with cost-driving factors), such strategies would signal price-setters' behaviour. A summary of the results for Lithuanian firms is reported in Table 36.

Systemised results show that the vast majority of Lithuanian firms employed flexible price setting strategies (over 60%) — they set prices either by negotiating them individually (around 40%) or by setting them in accordance to the evolution of the costs (around 20%) in the domestic market. Results are very similar considering foreign markets — flexible price setting strategies were reported by considerably more than half (over 60%) of Lithuanian firms.<sup>33</sup> On the other hand, there are also many firms (almost 40%) reporting that there is no autonomous price setting policy, i.e. prices are either regulated, set by the parent company or main customer, also set following the price setting strategies of the main

<sup>33</sup> Reported results are conditioned on the fact that the firm sells the main product on the corresponding markets.



competitors. These results are applicable in analysing both domestic and foreign markets. This would signal, to a certain extent, price rigidity or at least high dependency on external factors on the markets as a fairly large share of Lithuanian firms is price-takers and thereby their ability to adjust prices to the evolution of costs is limited. Interestingly, a higher fraction (almost 5%) of Lithuanian firms reported regulated price-setting strategies on domestic, as compared to foreign, markets (less than 2%).

Table 36. Price setting behaviour of Lithuanian firms on domestic and foreign markets; percentage of firms

Domestic markets										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Regulated	4.7	4.1	2.5	14.2	14.1	0.6	5.4	1.3	8.8	20.7
Set by parent company	4.1	4.2	2.7	6.4	0.0	9.9	2.4	3.5	2.8	6.2
Set by main customer(s)	6.1	6.5	3.6	8.4	0.0	8.0	3.3	4.8	7.6	2.1
Followed by main competitors	24.8	23.4	31.7	25.7	25.6	19.1	16.2	31.6	24.0	24.0
Cost-driven	20.9	20.8	19.0	20.5	47.1	20.9	22.2	25.5	16.1	19.8
Negotiated individually	38.1	40.0	38.2	22.3	9.1	41.5	50.1	31.6	38.7	23.1
Others	1.4	1.1	2.3	2.6	4.1	0.0	0.5	1.7	2.1	4.1
Foreign markets										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Regulated	1.7	2.3	0.0	0.0	7.8	0.0	9.1	2.9	0.4	0.0
Set by parent company	7.4	7.6	5.2	10.2	9.1	12.7	9.1	7.0	2.9	8.3
Set by main customer(s)	7.9	8.8	5.2	8.3	0.0	3.9	11.5	9.5	9.0	0.0
Followed by main competitors	20.7	20.6	20.7	23.5	7.8	16.0	2.3	24.0	25.1	20.8
Cost-driven	17.8	18.4	16.8	12.9	31.2	25.1	17.0	15.7	13.7	25.0
Negotiated individually	44.1	42.3	50.6	45.2	37.7	42.2	49.1	40.9	47.9	45.8
Others	0.4	0.0	1.6	0.0	6.5	0.0	1.8	0.0	0.9	0.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Results are somewhat divergent across firm size bins and across sectors. In particular, larger firms more often report being price-takers on domestic markets as compared to the other firm sizes and these results are very much dependent on the fact that a much higher fraction of such firms operates under regulated price-setting regimes (around 14%). Also, on domestic markets, the construction sector more often reported setting prices by negotiating them individually (slightly over 50%), whereas financial intermediation — operating under regulated price-setting regimes (around 20%). However, the latter sector systematically reported much more flexible price setting strategies on the foreign markets (around 70%) as compared to domestic ones (less than 50%).

## 7.2 Frequency of price changes on regular and non-regular patterns

Data for Lithuania on the frequency of price changes was also collected by the WDN3 survey. This indicator gives additional insight of how prices are determined, set and changed. Firstly, as in case of wages, it provides information about the degree of price flexibility in the economy, i.e. higher frequencies of price adjustments imply higher price flexibility. The degree of price flexibility depends, however, on price-setting conditions, i.e. if the firm is allowed to operate as a price-taker or a price-setter (see sub-section 7.1). Secondly, price change frequency provides information about how Lithuanian firms choose to adjust prices in relation to the evolution of labour costs, in particular, to the changes in wages. Empirical evidence on the topic of rigidities suggests that there should be a relationship between wage and price rigidity, but firms tend to change wages less often than prices,<sup>34</sup> indicating higher wage than price rigidity. It is noteworthy that for prices, in addition to conventional wage adjustment frequencies (see sub-section 6.4), greater variation in very high frequencies (i.e. daily, weekly, monthly, quarterly, half-yearly) was allowed by the WDN3 survey. Results for Lithuania are presented in Table 37.<sup>35</sup>

<sup>34</sup> Durant *et al.*, 2009.

<sup>35</sup> Reported results are conditioned on the fact that the firm was established no later than 2011. As very low frequencies for price adjustment were considered by the WDN3 survey, results were to some extent cleared from the option "Never".

Table 37. Frequency of price change in 2013; percentage of firms

	On regular pattern									
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
More than once a year: daily	3.6	4.2	1.3	3.3	0.0	4.6	3.1	2.3	4.6	0.0
More than once a year: weekly	1.0	0.7	2.5	0.9	0.0	0.0	0.0	2.8	0.0	0.0
More than once a year: monthly	3.6	4.0	1.0	3.7	9.0	0.9	3.8	7.2	1.4	0.0
More than once a year: quarterly	6.4	6.6	6.1	5.5	4.5	7.4	8.7	5.3	6.2	6.3
More than once a year: half-yearly	6.6	6.5	5.5	9.8	9.7	4.4	3.8	6.3	8.6	7.6
Once a year	18.1	18.5	16.8	17.7	15.7	29.1	5.7	19.6	15.7	12.2
Between one and two years	10.5	8.8	15.8	13.7	0.0	8.1	11.8	8.8	12.0	4.2
Less frequently than once every two years	6.8	6.4	9.5	5.5	4.5	10.3	6.1	5.4	6.7	6.3
Never	22.5	23.1	18.9	21.6	32.1	21.7	22.8	20.5	24.1	40.3
Don't know	21.4	21.4	22.7	18.3	24.6	13.6	34.2	21.9	20.7	23.1

	On non-regular pattern									
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
More than once a year: daily	3.2	3.8	1.0	2.5	4.5	1.2	3.1	2.4	5.0	0.0
More than once a year: weekly	0.8	0.7	1.3	1.7	0.0	0.0	0.0	2.4	0.0	0.0
More than once a year: monthly	5.2	4.7	6.9	7.7	0.8	4.6	4.6	6.2	4.7	5.5
More than once a year: quarterly	7.9	7.1	8.6	12.2	17.2	10.1	5.5	12.0	4.0	4.2
More than once a year: half-yearly	13.5	15.7	5.8	9.3	9.0	17.4	3.1	14.3	14.3	6.3
Once a year	15.5	15.1	16.5	18.7	9.0	27.4	16.0	13.5	12.1	11.8
Between one and two years	11.0	11.1	12.8	7.7	4.5	4.1	13.6	15.6	9.1	8.4
Less frequently than once every two years	10.7	9.9	14.3	10.6	14.2	10.3	7.9	6.4	15.3	22.3
Never	13.7	14.3	10.6	11.9	23.9	11.8	24.3	10.6	14.2	22.7
Don't know	18.4	17.8	22.1	17.7	17.2	13.1	22.0	16.6	21.4	18.9

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Distribution of Lithuanian firms in terms of price change frequencies in a regular pattern was situated in two main intervals: change in prices occurring once a year and between one and two years.<sup>36</sup> The share of Lithuanian firms, adjusting prices once a year, is higher (by almost 20%) than the fraction reporting price changes between one and two years (just over 10%). Price adjustments occurring on high frequencies (i.e. more than once a year and once a year) is reported by more than one third (almost 40%) of Lithuanian firms. Comparing those results to wage adjustment frequencies (see sub-section 6.4), a slightly lower fraction of firms (almost 35% in 2010–2013) reported the same systemised frequencies for base wage adjustments. Interestingly, in addition to these results, very high frequencies (i.e. more than once a year) in price changes were reported by a much higher fraction (over 20%) of Lithuanian firms as compared to likewise wage adjustment frequencies (less than 10%). Similar conclusions could be drawn by analysing frequency in price changes in a non-regular pattern, although very high price change frequencies are reported by an even larger share (over 30%) of Lithuanian firms.

Analysing divergences across sectors, it is noteworthy that the highest price change frequencies are reported in trade (more than once a year by 23.9 per cent on regular and 37.3 per cent on non-regular pattern), whereas lowest — in financial intermediation. In the latter sector base wage change frequencies were considerably higher, but this sector more often reported operating under regulated price-setting regimes (see sub-section 7.1).

## 8. WDN3 survey results: the effect of increase of minimum wages on macroeconomic variables

Lithuanian version of the WDN3 survey included the non-core block on the minimum wage. The main objective of this block was to analyse the effect of the minimum wage increase on the other macroeconomic variables. As Lithuania experienced a substantial increase in minimum wage from Jan 2013 (by approximately 17% from LTL 850 to LTL 1000), inclusion of this non-core block to the survey was particularly important in order to investigate how the firms adjusted to the increased minimum wage.

Legislation of minimum wage falls under the definition of labour market institutions, which causes wage rigidity and possibly has adverse effects on employment. Potentially, the increase in minimum wage might also have an impact on a variety of other labour market variables. These issues theoretically are discussed under the topic of labour market institutions (sub-section 8.1). Some background information on regulatory issues of minimum wages and relevant descriptive statistics for Lithuania is also presented in the introductory part (sub-section 8.2). Afterwards, the focus is on

<sup>36</sup> The option "Never" is chosen usually not to be commented because of the difficulties of interpretation. For results being conditioned on the fact that firm was established no later than the year 2011, the choice of such option might imply that prices are regularly not changed.

firm-level results for Lithuania. Coverage of the minimum wage system in Lithuanian firms (sub-section 8.3) and channels of adjustment completes the analysis on the effect of the minimum wage increase on economic variables. As increase in minimum wages should be directly associated with the increase in labour costs, the main possible adjustment channels were extensively studied by the WDN3 survey (sub-section 8.4).

### 8.1 Labour market institutions: minimum wages

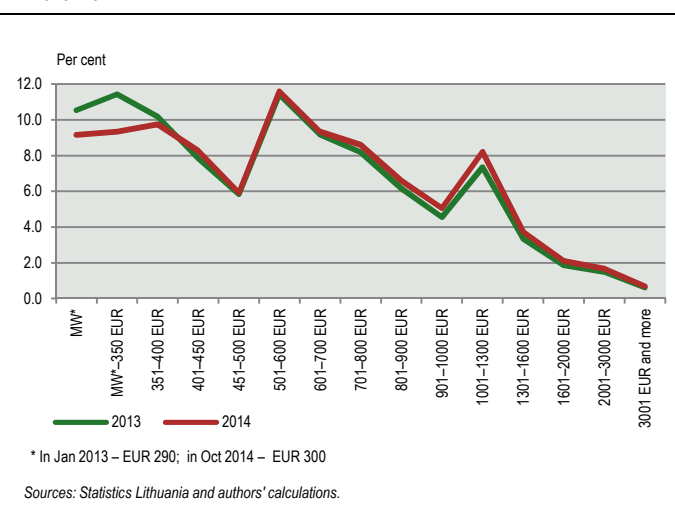
Legislation of minimum wage in the economy belongs to labour market institutional variables. The motivation behind this is that minimum wages set over the market equilibrium level causes wage rigidity, aberrantly rising labour costs and, therefore, might have negative effects on demand for labour and employment. However, these arguments are valid only if the coverage of the minimum wage system in an economy is high. Minimum wages fall under labour market structural indicators within institutional wage determination, under the same category as the collective wage bargaining system. The main reason for this is that minimum wages could be set by collective wage bargaining agreements on the half-centralised (for instance industry or occupational) levels of the economy or imposed by laws at the national level. Although economic theory suggests that highly centralised wage determination processes usually prevent excess wage claims (see sub-section 6.1) and lead to the wage level equal to or close to the market clearing level (i.e. that would be achieved under perfect competition), this is not the case for minimum wages. Uniform minimum wage setting strategy (i.e. no differentiation across age groups or different sectors) is considered to be the most harmful minimum wage setting strategy for an economy.<sup>37</sup>

Wage rigidity as a result of minimum wages might have an impact on employment, although empirical literature on the topic usually fails to prove such a relationship or finds little effect of employment response.<sup>38</sup> The evidence points towards several other adjustment channels that explain small or negligible impact of minimum wages on unemployment. The most common channels are reduction in hours worked, reduction in non-wage benefits, reduction in training, changes in employment composition, higher prices, improvement in efficiency, reduction in profits, offset by increase in demand and some others.

The primary minimum wage adjustment channel could be directly linked to the cost-adjustment decisions. For instance, introduction or increase in minimum wages could lead to reduction in hours worked if no other cost adjustment channel is possible. As minimum wage raises labour costs for a working hour, reduction in labour cost might be achieved by cutting hours worked instead of adjusting the number of employees. Other measures that allow controlling of costs are also possible. In particular, increase in minimum wages could call for reduction in non-wage benefits or reduction in training spending, the costs not classified as labour costs, but closely related to those.

Non-cost adjustment strategies are also listed among the possible minimum wage adjustment channels. Change in employment composition, for instance, might occur if employers choose to improve the skills of their labour force. As rise in minimum wage is associated with the overall growth in pay for employees, increased wages might call for skill improvement to the level that corresponds to the higher wages. Such strategies might, however, lead to additional increase in other, complementary to labour, cost components. Response to increase in labour costs might also lead to higher prices for products or services provided by the firms to the market. Such practices where at least a part of the increased labour costs are passed through to prices are considered the most common outcomes of minimum wage increase.

**Fig.38. Distribution of employees in accordance to wage intervals in Lithuania in 2013–2014**

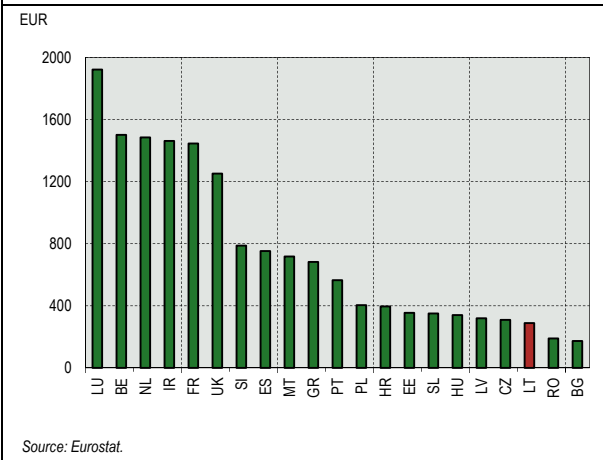


<sup>37</sup> Nickell, 1997; Nickell *et al.*, 2002; Nickell *et al.*, 2005; Bassanini *et al.*, 2006; Baccaro *et al.*, 2007.

<sup>38</sup> Nickell, 1997; Nickell *et al.*, 2002; Nickell *et al.*, 2005; Bassanini *et al.*, 2006; Schmitt, 2013.

Improvement in efficiency, or increase in work effort and productivity, could also be listed among the adjustment channels for minimum wage increase. It is considered that a rise in wages might lead to increased motivation and stimulate greater work effort. In this case, wage growth could be totally offset by growth in productivity. Reduction in profits would, on the other hand, occur if employers absorb all the increase in labour costs associated with minimum wage increase, whereas increase in spending for consumption (with minimum wage as stimulus) could spur demand for products and services. The latter situation is associated with increase in wages and, thereby, with the increase in consumer spending, mitigating the impact of increased labour cost. In regards to empirical evidence on the adjustment channels, the impact of minimum wages on price increase or reduction in profits is found to be usually small, but present; the effect on other variables is usually indecisive.<sup>39</sup> Some of the minimum wage adjustment channels listed above were considered by the Lithuanian version of the WDN3 survey, with the results presented in the sub-sections below.

Fig.39. Minimum monthly wage in Q1 2014



## 8.2 Institutional environment in Lithuania: minimum wages

The institutional environment for minimum wage determination in Lithuania is as follows. Lithuania belongs to the group of countries having statutory minimum wage. Minimum wages in the country are set uniformly on the highest — national — level of economy and in the presence of low union and collective wage system coverage (see sub-section 4.1), minimum wage could be a complementary measure to characterise institutional wage determination structure in the country. Minimum wage coverage in 2013 was 10.5 per cent (see Fig. 38) after its substantial increase by approximately 17 per cent (from LTL 850 to LTL 1000) in January 2013.

Fig.40. Minimum wage to average wage ratio, business economy in 2013

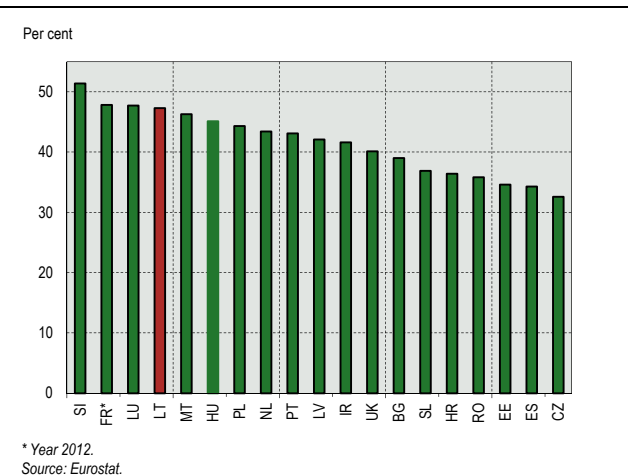
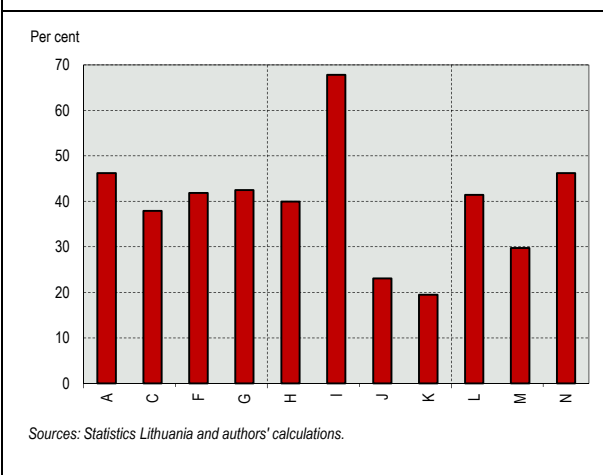


Fig.41. Minimum wage to average wage ratio by NACE2 sectors in Lithuania 2013



The level of minimum wages tends to differ substantially across countries and Lithuania has one of the lowest minimum wage levels among the EU economies (see Fig. 39). However, this indicator is usually not considered to be the indicative one to characterize labour market institutional structure in economy. Instead, minimum wage to average (or median) wage ratio is considered to represent labour market institutions, this measure also could be used for comparability reasons among countries. Minimum wage to average ratio in Lithuania is among the highest ones in the EU — 47.3 per

<sup>39</sup> Schmitt 2013.

cent in 2013 (see Fig. 40), though with considerable divergences across the NACE2 sectors in the economy. In 2013 the lowest minimum to average wage ratio was in financial intermediation and the highest — in accommodation and food service activities (see Fig. 41).

### 8.3 Minimum wage coverage in Lithuania: survey-based descriptive results

Descriptive results retrieved from the WDN3 survey on minimum wage coverage supplement the official descriptive statistics presented in the previous sub-section. In particular, micro-level results, listed in Table 42, indicate a slightly higher minimum wage coverage in Lithuania as compared to figures provided by official statistics (10.5% in 2013). After the minimum wage increase in Jan 2013 its coverage in the economy increased from 15.3 per cent to 17.8 per cent. The WDN3 survey results also denote that minimum wage coverage tends to correlate with the size of firms — higher coverage is found among small firms (29.7%–35.6%) and lower — among large and very large firms (11.9%–15% and 5.0%–5.4% respectively). Labour intense production sectors — construction, trade, business services and especially financial intermediation — report typically somewhat lower minimum wage coverage as compared to manufacturing; this tendency could be directly linked to the compositional effects of the labour force (see sub-section 6.2). The latter sector in economy is characterised by the highest share of lower skilled (both manual and non-manual) employees in their labour force.

Table 42. Minimum wage coverage in Lithuania - percentage of employees receiving minimum wages; in per cent

	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Before minimum wage increase in Jan 2013	15.3	29.7	17.9	11.9	5.0	16.2	15.3	16.6	14.2	4.5
After minimum wage increase in Jan 2013	17.8	35.6	18.3	15.0	5.4	20.4	17.2	16.7	17.5	5.9

Notes: employment-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

### 8.4 Adjustment channels of minimum wage increase: the survey-based evidence

The WDN3 survey investigated the effect of minimum wage increase on other macroeconomic indicators. The focus was to seek for the answer as to how Lithuanian firms succeed in dealing with the rise in labour costs associated with minimum wages. The Lithuanian version of the WDN3 survey considered such pre-determined adjustment channels as decrease in employment (through layoffs and/or reduction in new hires), increase in prices, reduction in non-labour costs, increase in productivity and others. All these possible channels, along with several others, theoretically were presented in the introductory part of the section (see sub-section 8.1).

Firm-level results for Lithuania reveal that the increase in minimum wages caused an increase in total labour costs by approximately 11.1 per cent. Table 43 lists the results. The impact tended to be higher for the firms that reported higher shares of minimum wage receivers in their labour force — small firms experienced a labour cost increase higher than the economy average (12.7%). By sectors, the same tendencies are observable in manufacturing (14.5%) and construction (18.0%). The rise in labour costs was naturally followed by some adjustment strategies — reduction in employment, increase in prices or overall efficiency as well reduction in non-labour costs. The majority of these possible adjustment channels were pre-determined by the WDN3 survey. Firm-level results, provided in Table 44, with its extended composition in Table A9 of Appendix A, indicate that these channels were extensively used by Lithuanian firms to deal with increase in labour costs.

Table 43. Increase in total labour costs in response to minimum wage increase; in per cent

	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
After minimum wage increase in Jan 2013	11.1	12.7	7.0	5.0	3.6	14.5	18.0	7.9	11.1	4.2

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table 44. The effect of increase in minimum wages on other macroeconomic variables; percentage of firms

	Economy (total)	RELEVANT AND VERY RELEVANT					Manufacturing	Construction	Trade	Business services	Financial intermediation
		Small	Medium	Large	Very large						
Lay off people	1.6	2.0	0.0	1.2	0.0	0.5	4.8	0.0	2.6	0.0	
Hire less	8.7	10.7	2.3	2.3	4.5	7.2	13.9	6.3	9.8	3.7	
Increase product prices	8.3	9.5	5.5	1.5	8.9	13.4	10.0	4.8	8.8	2.0	
Reduce non-labour costs	18.1	20.6	9.7	11.1	13.4	29.0	17.9	12.9	18.4	13.3	
Increase productivity	24.6	25.4	23.3	18.8	23.0	43.2	32.0	18.2	19.9	16.5	
Other	63.4	66.6	57.8	0.0	0.0	55.7	100.0	52.4	66.1	33.3	

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

According to the survey results, the effect of minimum wages increase on employment outcomes is small. Only a minor fraction of firms (less than 2%) reported that they used such strategies as reduction in the number of employees (i.e. this strategy was reported to be relevant and very relevant). The decisions to hire less were taken by a somewhat higher share of firms (almost 9%), but the most popular minimum wage adjustment strategies were nevertheless not related to changes in employment. Reduction in non-labour costs and especially the increase in productivity were more extensively used as responding measures to the increased cost of labour (18.1% and 24.6% respectively). Among other adjustment channels (used by more than 60 per cent of Lithuanian firms) reduction in bonuses, working time adjustments, increase in efficiency (new technologies, increase in overall efficiency) and even efforts to increase revenue were used as reactive measures by the firms. The effect of minimum wage increase on product prices is found to be marginal (the measure used by 8.3% of the firms). Finalising the results, increase in minimum wage also brought about a need to raise wages to the employees earning more than minimum wages; this effect was reported by more than one fourth (25.4%) of all Lithuanian firms (i.e. having and not having minimum wage receivers). These tendencies could reflect a substantial proportion of employees receiving wages just slightly above the minimum wage level in the economy, although wage adjustment for higher income earners, associated with an increase in minimum wages, should not be ignored. Divergences across firm size bins and sectors are present though highly correlated to the minimum wage coverage (and consequently magnitude of the increase in total labour costs) in Lithuanian firms. Small firms to a higher extent report applying adjustment measures, though there are no obvious signs that some particular measures were preferred more against others by the firms across the different firm size bins. Distribution of measures across sectors tend to differ to a higher extent. In particular, the manufacturing sector more frequently reports an increase in productivity, whereas construction applies regularly other measures to offset the increase in labour costs.

Minimum wage coverage in the firms appeared to be an important indicator that determines cost adjustment strategies. Table 45 reports more extensive — conditioned — results on the strategies used under different minimum wage coverage, verifying the importance of this indicator.

Table 45. The effect of increase in minimum wages on other macroeconomic variables under different minimum wage coverage; percentage of firms

MINIMUM WAGE COVERAGE LESS THAN OR EQUAL TO 25%										
RELEVANT AND VERY RELEVANT										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Lay off people	0.1	0.0	0.0	1.5	0.0	1.1	0.0	0.0	0.0	0.0
Hire less	2.9	3.8	0.0	1.3	4.5	0.8	5.2	3.2	2.6	2.4
Increase product prices	3.2	2.9	4.4	1.4	8.9	1.7	13.4	0.0	3.7	2.4
Reduce non-labour costs	5.8	5.2	5.9	7.6	13.4	5.7	5.2	5.9	5.7	9.2
Increase productivity	17.9	18.2	15.9	18.9	23.0	33.7	29.1	15.2	11.8	15.4
Other	76.5	81.6	67.9	0.0	NA	79.5	100.0	62.6	83.9	50.0
MINIMUM WAGE COVERAGE BETWEEN 26% AND 50%										
RELEVANT AND VERY RELEVANT										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Lay off people	10.9	13.6	0.0	0.0	NA	0.0	30.9	0.0	14.7	0.0
Hire less	15.1	18.1	1.4	0.0	NA	0.0	30.9	13.2	14.7	30.6
Increase product prices	12.6	13.4	13.0	0.0	NA	0.0	15.5	5.2	22.0	0.0
Reduce non-labour costs	47.4	54.8	12.2	13.1	NA	65.8	50.3	46.3	40.2	65.3
Increase productivity	45.4	44.0	61.5	27.9	NA	82.9	59.7	31.7	36.3	65.3
Other	52.6	52.6	NA	NA	NA	100.0	100.0	0.0	50.0	NA
MINIMUM WAGE COVERAGE BETWEEN 51% AND 75%										
RELEVANT AND VERY RELEVANT										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Lay off people	0.0	0.0	0.0	0.0	NA	0.0	0.0	0.0	NA	NA
Hire less	20.4	18.5	26.5	27.1	NA	14.2	44.6	0.0	NA	NA
Increase product prices	12.7	16.5	0.0	0.0	NA	0.0	0.0	19.0	NA	NA
Reduce non-labour costs	43.3	46.7	22.1	54.1	NA	28.5	55.4	0.0	NA	NA
Increase productivity	33.9	25.5	77.9	27.1	NA	71.5	44.6	19.0	NA	NA
Other	100.0	100.0	NA	NA	NA	100.0	100.0	100.0	NA	NA
MINIMUM WAGE COVERAGE BETWEEN 76% AND 100%										
RELEVANT AND VERY RELEVANT										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Lay off people	1.4	1.6	0.0	0.0	NA	0.0	0.0	0.0	4.3	0.0
Hire less	19.3	20.5	9.7	0.0	NA	17.3	12.5	14.4	27.6	0.0
Increase product prices	19.3	20.4	9.7	0.0	NA	34.6	0.0	18.0	14.8	0.0
Reduce non-labour costs	32.9	33.3	31.0	22.9	NA	51.9	12.5	20.8	35.4	17.3
Increase productivity	30.8	32.3	21.4	0.0	NA	43.2	12.5	20.8	36.2	0.0
Other	31.1	39.3	0.0	0.0	NA	0.0	NA	100.0	42.7	0.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

The most common strategy applied by the firms having up to 25% of minimum wage receives in their labour force was to target entirely other costs or employ other cost-adjustment policies. Higher coverage — above 25 per cent — led to somewhat different adjustment decisions although other policies remained an important element to deal with cost increase. Decisions to hire less and increase product prices became more relevant for the firms having higher minimum wage coverage. At the same time, the importance of the rise in productivity, along with non-labour cost reduction measures diminish with increase in minimum wage coverage (i.e. these adjustment strategies are at least partially offset by increased significance of such measures as increase in prices or decisions to hire less). To conclude, the important message from the WDN3 survey data is that the minimum wage increase might have an effect on employment outcomes only if minimum wage coverage is high; otherwise, other adjustment channels, not cut in employment, are preferred by Lithuanian firms.

## 9. Comparison of the results from the WDN3 and the WDN1 surveys

As Lithuania was involved in the first wave of the WDN project, comparison of the results between the WDN1 and the WDN3 surveys might be insightful. Firstly, it enables a comparison of some surveys' results to official statistics, reported by Statistics Lithuania and, secondly, it also allows analysing change in behaviour of the firms throughout time. The focus is laid on three indicators, in particular the evolution of the labour cost share and bonuses to labour costs (sub-section 9.1), collective wage bargaining coverage (sub-section 9.2) and frequency in wage and price adjustments (sub-section 9.3).

## 9.1 Evolution of the labour cost share throughout time

Firm-level results show that labour cost share and share of bonuses to labour costs tended to decrease over time in Lithuania. Table 46 reports the results.

Table 46. Share of labour costs to total costs and share of bonuses to labour costs in 2007 and 2013; in per cent

	2013	2007	2013	2007	2013	2007	2013	2007	2013	2007	2013	2007	2013	2007	2013	2007				
	Economy (total)		Small		Medium		Large		Very large		Manufacturing		Construction		Trade		Business services		Financial intermediation	
Share of labour costs to total costs, per cent	39.8	42.2	40.5	43.0	38.7	39.9	36.4	39.9	32.9	NA	35.5	36.3	39.3	40.8	37.1	45.2	44.2	43.2	48.1	43.3
Share of bonuses and benefits to labour costs, per cent	11.7	13.0	10.7	11.5	15.4	12.8	14.1	12.8	13.4	NA	13.0	8.9	15.9	26.2	10.8	12.3	10.5	11.6	10.9	13.7

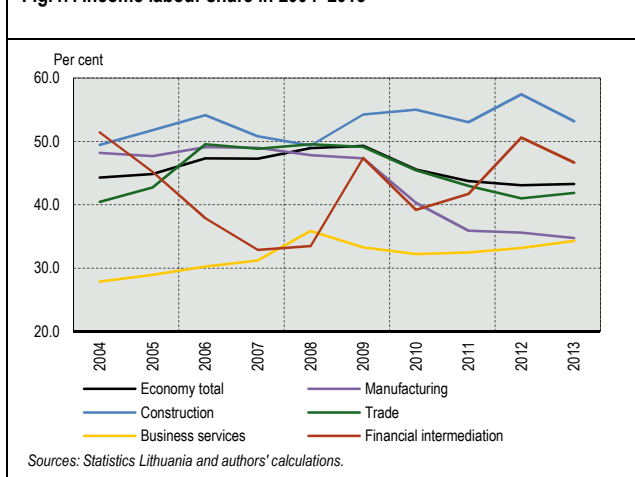
Notes: firm-weighted averages.

Sources: Lithuanian WDN1 and WDN3 surveys, authors' calculations.

Data reveals that the labour cost share in Lithuania declined from 42.2 per cent in 2007 to 39.8 per cent in 2013; share of bonuses to labour costs decreased in the respective years from 13 per cent to 11.7 per cent. Such tendencies are broadly in line with the official statistical figures provided by Statistics Lithuania<sup>40</sup> (see Fig. 47), suggesting that income labour share in Lithuanian economy declined by 4 p.p. 2007 to 2013 (i.e. from 47.3% to 43.3%).

In accordance to firm-level data, manufacturing, the most capital intense and export-oriented sector in the economy, in both periods reported the lowest labour costs share with a decreasing pattern over time. The most labour intense production sectors in the economy, on the other hand, appeared to be financial intermediation and business services — these two sectors report increasing patterns in labour share throughout time. Construction, recording a decrease in labour share, in accordance to the WDN3 survey data is also one of the most labour intense sectors in economy. In comparing these figures to official statistics, similar income labour share development patterns are observable, but divergences are present nevertheless. Official figures report rather low income labour share in business services and increasing labour share patterns throughout time in the construction sector. The sharpest decline in the labour cost share between 2007 and 2013, in accordance to surveys' data, occurred in trade (dropped by 8 p.p.); official statistics report a somewhat smaller fall in income labour share (by 7 p.p.) throughout time. Overall tendencies show that manufacturing is becoming increasingly capital intense in the production sector of the economy; similar trends are observable also in trade, although this sector is more dependent on labour as compared to manufacturing. On the contrary, financial intermediation is gradually moving towards more labour intense production techniques. The share of bonuses dropped sharply between 2007 and 2013 in the construction sector (by more than 10 p.p.), but this sector remains the one reporting highest share of bonuses to labour costs.

Fig.47. Income labour share in 2004–2013



## 9.2 Evolution of collective wage bargaining coverage throughout time

Collective wage bargaining coverage also tended to decrease throughout time in Lithuania — the share of employees covered by collective agreements on any level of the economy, in accordance to the surveys' data, decreased from 23.2 per cent to 9.7 per cent. Results are reported in Tables 48 and 49. These tendencies are in line with the official statistics on union coverage, stating that unionisation of the economy decreased by approximately 1 p.p. from 2007 to 2013 (see sub-section 4.1), although survey-based evidence suggests a much sharper decline in collective agreement coverage. Decline is most evident in regards to firm level agreements in small firms and firms operating in the service sectors. Larger firms and the construction sector report smaller change in collective wage bargaining coverage throughout time.

<sup>40</sup> The income labour share is calculated as a ratio between total labour costs and nominal value added (in per cent).



Table 48. Collective wage bargaining agreements at firm level in 2007 and 2013; percentage of firms

	2013		2007		2013		2007		2013		2007		2013		2007		2013		2007	
	Economy (total)		Small		Medium		Large		Very large		Manufacturing		Construction		Trade		Business services		Financial intermediation	
No, such an agreement does not exist	90.7	78.6	92.3	77.1	91.2	85.8	78.2	75.4	64.2	NA	94.9	81.1	84.7	80.3	88.9	76.9	92.3	79.1	93.2	66.7
No, the agreement exists but the firm opted-out	1.0	NA	0.8	NA	1.2	NA	1.9	NA	4.5	NA	0.0	NA	2.1	NA	0.9	NA	1.0	NA	1.9	NA
Yes, such an agreement is in effect	8.4	21.4	7.0	23.0	7.7	14.2	19.9	24.6	31.3	NA	5.1	18.9	13.3	19.7	10.2	23.1	6.6	20.9	4.9	33.3

Notes: firm-weighted shares.

Sources: Lithuanian WDN1 and WDN3 surveys, authors' calculations.

Table 49. Collective wage bargaining agreements outside the firm in 2007 and 2013; percentage of firms

	2013		2007		2013		2007		2013		2007		2013		2007		2013		2007	
	Economy (total)		Small		Medium		Large		Very large		Manufacturing		Construction		Trade		Business services		Financial intermediation	
No, such an agreement does not exist	98.5	93.6	99.0	94.2	97.7	91.1	94.7	94.2	100.0	NA	98.9	97.9	95.0	93.2	98.2	90.9	99.7	93.9	100.0	100.0
No, the agreement exists but the firm opted-out	0.2	4.7	0.3	3.9	0.0	6.5	0.0	5.8	0.0	NA	0.0	1.1	0.0	4.5	0.7	7.0	0.0	4.4	0.0	0.0
Yes, such an agreement is in effect	1.3	1.7	0.7	1.9	2.3	2.4	5.3	0.0	0.0	NA	1.1	1.1	5.0	2.3	1.1	2.1	0.3	1.7	0.0	0.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN1 and WDN3 surveys, authors' calculations.

### 9.3 Change in base wage and price adjustment frequency throughout time

An additional interesting feature appears in comparing the WDN1 and WDN3 surveys' data on frequencies in wage and price adjustment. Perception of the firms over base wage change frequency from both waves of the surveys is reported in Table 50. As both surveys covered the pre-crisis period (the WDN1 — the year of 2007, and the WDN3 — the period before 2008), a comparison of the results between these two waves for the same period becomes possible. Perception over price change frequencies in 2007 and 2013 are reported in Table 51.

In accordance to the WDN1 data, almost two thirds of Lithuanian firms (60%) report very high base wage change frequencies (more than once a year and once a year) in 2007. The same period covered by the WDN3 survey (i.e. the period before 2008) reports a considerably lower share of such firms — around one third (31.4%). In 2008–2009, data from the WDN3 survey indicates that the same frequencies are reported by a similar proportion of firms (29.3%) and in 2010–2013 — by almost 35 per cent of Lithuanian firms. Inconsistencies between the WDN1 and the WDN3 data for the pre-crisis period are unexpected and disappointing, as previous findings that wages in Lithuania show a clearly increasing flexibility pattern over time (see sub-section 6.4) cannot be confirmed.

Price change frequencies cannot be compared in the same manner between these two waves of the surveys, but differences in the results are also surprising. In 2007, the firms reporting high frequencies (more than once a year and once a year) formed over 60 per cent of economy; in 2013 this share dropped to around 40 per cent. Nevertheless, price change frequencies are very much related to changes in wages in all the periods, supporting all the previous insights of a high degree of price flexibility in Lithuania. Also, as a relatively high share of the firms report high frequencies for both wage and price changes, the Lithuanian market could be characterised as a flexible one in respect to these two indicators.

Table 50. Frequency of base wage change; percentage of firms

IN 2007 – WDN1 DATA										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
More than once a year	25.4	22.8	29.8	32.1	NA	25.3	33.7	24.4	24.1	33.3
Once a year	35.6	33.3	41.3	38.9	NA	39.3	46.6	32.1	32.6	66.7
Between one and two years	-	-	-	-	-	-	-	-	-	-
Every two years	6.5	7.0	5.4	5.3	NA	7.7	0.0	5.5	9.4	0.0
Less frequently than once every two years	9.5	12.5	3.4	3.4	NA	7.6	0.0	10.9	12.9	0.0
Never/Don't know	23.0	24.4	20.0	20.3	NA	20.2	19.7	27.1	21.0	0.0
Before 2008 – WDN3 DATA										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
More than once a year	9.4	9.5	6.2	15.4	4.9	14.1	14.4	8.5	6.7	9.3
Once a year	22.0	21.5	22.9	25.6	15.6	21.7	14.1	18.8	26.8	15.5
Between one and two years	17.8	16.1	26.4	12.9	19.7	26.2	20.6	17.5	13.7	9.3
Every two years	9.0	8.4	9.4	13.3	4.9	8.8	16.5	5.2	10.4	14.2
Less frequently than once every two years	17.7	19.0	15.4	10.7	26.2	7.5	8.1	24.4	18.8	21.0
Never/Not applicable	24.3	25.6	19.8	22.1	28.7	21.7	26.3	25.7	23.6	30.9
During 2008–2009 – WDN3 DATA										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
More than once a year	7.6	6.5	7.1	17.6	4.9	10.0	13.9	5.6	6.7	9.6
Once a year	21.7	21.1	24.0	23.6	10.7	21.7	19.1	20.3	23.4	22.6
Between one and two years	21.7	21.8	26.5	13.3	15.6	34.1	22.6	17.8	19.7	12.5
Every two years	7.1	7.6	4.7	8.2	4.9	8.1	10.9	6.6	6.4	2.4
Less frequently than once every two years	13.6	13.4	14.6	11.9	16.4	5.1	6.5	18.3	14.9	13.9
Never/Not applicable	28.3	29.5	23.1	25.5	47.5	21.0	27.1	31.4	29.0	38.9
During 2010–2013 – WDN3 DATA										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
More than once a year	9.8	9.7	7.6	15.6	9.0	9.8	20.5	6.2	9.3	14.4
Once a year	25.0	25.9	22.9	22.0	14.9	19.8	20.3	26.3	27.6	25.5
Between one and two years	21.2	20.9	22.8	22.2	13.4	39.4	18.0	18.8	16.6	13.7
Every two years	9.7	10.5	7.7	5.4	9.0	3.7	10.0	9.8	12.2	7.6
Less frequently than once every two years	12.5	11.3	16.0	14.3	27.6	12.1	8.3	15.4	11.5	10.3
Never/Not applicable	21.9	21.7	23.0	20.5	26.1	15.2	22.8	23.5	22.8	31.6

Notes: firm-weighted averages.

Sources: Lithuanian WDN1 and WDN3 surveys, authors' calculations.

Table 51. Frequency of price change in 2007 and 2013; percentage of firms

IN 2007 – WDN1 DATA										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
More than once a year: daily	2.1	2.5	1.3	1.7	NA	1.1	2.3	4.1	0.7	0.0
More than once a year: weekly	2.6	2.8	2.7	1.9	NA	2.1	0.0	5.7	0.7	0.0
More than once a year: monthly	6.2	7.1	4.3	4.8	NA	3.1	0.0	10.6	4.8	33.3
More than once a year: quarterly	11.5	9.9	15.3	14.0	NA	19.6	14.6	8.8	8.5	33.3
More than once a year: half-yearly	16.3	17.6	15.7	10.7	NA	19.6	19.3	14.2	16.3	0.0
Once a year	22.7	25.0	18.0	17.4	NA	20.1	39.8	16.5	26.1	0.0
Once every two years	3.4	3.8	1.2	4.8	NA	2.1	0.0	2.1	7.1	0.0
Less frequently than once every two years	3.0	1.1	5.4	8.9	NA	3.2	0.0	2.1	3.4	0.0
Never	0.4	0.3	0.0	1.7	NA	1.1	0.0	0.0	0.7	0.0
There is not a defined pattern	31.7	30.0	36.1	34.0	NA	28.2	24.0	36.1	31.9	33.3
ON REGULAR PATTERN IN 2013 – WDN3 DATA										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
More than once a year: daily	3.6	4.2	1.3	3.3	0.0	4.6	3.1	2.3	4.6	0.0
More than once a year: weekly	1.0	0.7	2.5	0.9	0.0	0.0	0.0	2.8	0.0	0.0
More than once a year: monthly	3.6	4.0	1.0	3.7	9.0	0.9	3.8	7.2	1.4	0.0
More than once a year: quarterly	6.4	6.6	6.1	5.5	4.5	7.4	8.7	5.3	6.2	6.3
More than once a year: half-yearly	6.6	6.5	5.5	9.8	9.7	4.4	3.8	6.3	8.6	7.6
Once a year	18.1	18.5	16.8	17.7	15.7	29.1	5.7	19.6	15.7	12.2
Between one and two years	10.5	8.8	15.8	13.7	0.0	8.1	11.8	8.8	12.0	4.2
Less frequently than once every two years	6.8	6.4	9.5	5.5	4.5	10.3	6.1	5.4	6.7	6.3
Never	22.5	23.1	18.9	21.6	32.1	21.7	22.8	20.5	24.1	40.3
Don't know	21.4	21.4	22.7	18.3	24.6	13.6	34.2	21.9	20.7	23.1

Notes: firm-weighted averages.

Sources: Lithuanian WDN1 and WDN3 surveys, authors' calculations.

## 10. Conclusions

This last section draws some overall preliminary conclusions about the rigidity in wages and prices in Lithuania. The WDN3 survey results, although based only on descriptive statistics, indicate that both wages and prices show a rather

high degree of flexibility in Lithuania. The most obvious indication for wage flexibility was the incidence of wage cuts occurring during economic crisis of 2008–2009. Wage flexibility was assessed in this paper not only by analysing the incidence of the wage cut, but also from several other perspectives, such as wage adjustment to inflation practices, frequency of base wage changes, by evaluating labour costs for newly hired, etc. Flexibility in wages could mainly be explained by the labour market's institutional structure, in particular low collective wage bargaining coverage. These findings are important from the overall macroeconomic perspective, because flexible wages allowed Lithuanian firms to more quickly respond to the changing economic environment. Low wage rigidity also implied lower employment losses in the presence of adverse economic shocks, although the employment-based cost reduction strategy was also used extensively by Lithuanian firms during the crisis. Yet, cost adjustment strategies seem to be asymmetrical and depend on the state of the economy — the business cycle seems to play a role in the behaviour of firms. Flexibility in prices was denoted by a high share of Lithuanian firms adjusting prices on high frequencies.

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## Appendix A. WDN3 survey results for Lithuania

### A1. The effect of the shocks on firms' activity

Table A1a. Change in level of demand; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	26.2	25.4	28.0	25.1	43.4	22.0	35.7	29.8	22.9	16.9
Moderate decrease	31.8	32.2	27.7	36.6	32.0	33.8	32.2	31.5	30.9	35.7
Unchanged	29.8	29.9	31.3	29.2	13.9	33.0	19.2	26.9	33.1	36.6
Moderate increase	10.6	11.1	10.7	8.0	5.7	10.0	11.8	10.8	10.6	10.8
Strong increase	1.7	1.5	2.3	1.1	4.9	1.3	1.1	1.1	2.6	0.0
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	7.8	8.9	2.1	7.3	9.0	11.9	3.1	4.4	10.7	5.7
Moderate decrease	18.1	18.1	20.0	14.2	17.9	15.9	25.8	17.2	17.3	21.3
Unchanged	32.5	33.8	27.8	30.1	27.6	29.3	26.5	33.1	35.4	35.0
Moderate increase	36.4	33.3	47.7	44.0	44.8	35.1	36.1	41.8	32.4	33.1
Strong increase	5.2	5.9	2.4	4.5	0.8	7.9	8.6	3.5	4.3	4.9

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A1b. Change in volatility/uncertainty of demand; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	17.8	17.4	19.7	14.4	34.4	15.7	18.7	22.6	14.6	10.8
Moderate decrease	30.3	29.9	27.8	38.2	31.2	27.7	48.1	30.5	26.9	41.3
Unchanged	40.1	41.0	39.5	36.9	25.4	47.3	16.4	36.6	45.5	36.2
Moderate increase	10.3	9.8	13.1	9.3	9.0	9.3	15.7	8.6	11.0	9.4
Strong increase	1.5	2.0	0.0	1.1	0.0	0.0	1.1	1.8	2.1	2.4
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	5.7	6.4	2.1	6.3	4.5	8.3	2.4	3.0	8.1	7.6
Moderate decrease	16.4	16.5	16.8	11.8	26.9	18.9	16.6	15.9	15.4	22.1
Unchanged	40.1	42.0	34.3	36.4	23.9	32.5	39.6	40.6	43.2	41.1
Moderate increase	34.0	30.6	45.7	42.3	44.8	35.1	36.6	36.1	30.7	29.3
Strong increase	3.9	4.5	1.2	3.3	0.0	5.3	4.8	4.4	2.6	0.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A1c. Change in access to external financing through the usual financing channels; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	10.7	11.4	9.4	4.1	29.5	8.4	9.1	8.9	13.9	2.4
Moderate decrease	17.8	18.6	14.6	19.4	10.7	15.0	23.7	17.9	17.8	14.6
Unchanged	66.7	65.2	72.6	67.9	59.8	71.0	63.7	69.4	62.6	83.1
Moderate increase	4.2	4.2	3.4	6.3	0.0	5.0	2.5	3.7	4.8	0.0
Strong increase	0.6	0.6	0.0	2.3	0.0	0.6	1.1	0.0	1.0	0.0
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	6.1	6.7	4.3	2.1	9.0	10.9	3.6	2.7	7.8	5.7
Moderate decrease	13.2	15.0	8.7	5.7	8.2	12.6	20.4	10.6	13.6	7.6
Unchanged	69.6	68.8	73.5	71.5	59.7	70.9	71.6	68.0	69.6	79.9
Moderate increase	9.9	8.8	11.2	19.5	9.7	3.1	43.4	17.4	8.2	6.8
Strong increase	1.2	0.7	2.4	1.2	13.4	2.5	0.0	1.5	0.9	0.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A1d. Change in customers' ability to pay and meet contractual conditions; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	19.8	20.1	22.0	13.7	14.8	21.7	24.5	19.9	17.9	11.7
Moderate decrease	33.1	33.1	30.2	37.3	41.0	24.0	42.0	37.7	31.0	38.0
Unchanged	40.8	40.9	39.5	42.2	39.3	48.6	30.0	36.4	43.4	45.5
Moderate increase	5.5	4.7	8.3	6.8	4.9	5.6	3.6	6.0	5.6	4.7
Strong increase	0.8	1.1	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	8.5	8.8	7.2	6.7	13.4	11.4	13.7	4.9	8.7	7.6
Moderate decrease	24.0	26.2	19.0	14.1	12.7	16.7	28.0	25.7	24.4	25.1
Unchanged	47.0	44.7	53.0	57.3	51.5	53.1	37.4	45.7	48.7	46.0
Moderate increase	19.0	18.7	19.6	21.0	17.9	18.3	18.5	20.1	18.3	19.4
Strong increase	1.6	1.6	1.2	0.8	4.5	0.4	2.4	3.5	0.0	1.9

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A1e. Change in availability of supplies from the usual suppliers; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	3.6	3.2	6.0	1.2	9.8	2.9	2.5	5.1	3.0	0.0
Moderate decrease	17.0	18.3	9.9	18.1	29.5	8.7	19.3	26.4	12.2	6.1
Unchanged	72.6	71.6	77.3	74.8	55.7	83.4	66.4	60.4	79.4	91.6
Moderate increase	6.1	6.0	6.8	5.9	4.9	5.0	11.8	7.3	4.4	2.4
Strong increase	0.7	1.0	0.0	0.0	0.0	0.0	0.0	0.9	1.0	0.0
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	2.8	3.3	1.1	1.1	4.5	0.4	0.6	2.8	4.7	1.9
Moderate decrease	10.0	10.5	9.2	6.1	12.7	12.6	6.9	13.8	6.9	0.0
Unchanged	70.0	69.7	68.3	78.7	64.2	67.7	69.3	63.8	76.4	91.3
Moderate increase	15.4	14.5	20.2	14.2	18.7	18.2	20.8	16.9	11.2	6.8
Strong increase	1.7	2.0	1.2	0.0	0.0	1.1	2.4	2.8	0.9	0.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

## A2. Persistence of shocks

Table A2a. Persistence of volatility/uncertainty of demand shock; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
<b>STRONG OR MODERATE DECREASE</b>										
Transitory	27.4	23.5	40.3	28.9	40.9	32.1	49.2	23.5	20.7	40.1
Only partly persistent	50.9	53.5	38.9	55.6	44.2	59.3	31.8	51.1	54.0	55.2
Long-lasting	21.7	23.0	20.8	15.5	15.0	8.5	19.0	25.4	25.3	4.7
<b>STRONG OR MODERATE INCREASE</b>										
Transitory	48.5	42.9	55.1	73.8	100.0	39.8	35.9	49.3	54.7	41.0
Only partly persistent	43.6	47.6	44.9	11.8	0.0	60.2	64.1	50.7	26.9	59.0
Long-lasting	7.9	9.5	0.0	14.5	0.0	0.0	0.0	0.0	18.4	0.0
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
<b>STRONG OR MODERATE DECREASE</b>										
Transitory	24.4	24.9	17.7	25.5	43.0	13.1	51.4	29.9	19.1	16.8
Only partly persistent	51.9	50.4	65.6	51.5	28.4	83.4	42.2	44.0	44.0	63.4
Long-lasting	23.7	24.8	16.7	23.0	28.6	3.6	6.5	26.1	36.9	19.7
<b>STRONG OR MODERATE INCREASE</b>										
Transitory	47.6	47.3	47.5	54.5	30.0	44.4	60.5	42.5	49.6	44.4
Only partly persistent	41.8	42.5	44.8	26.6	58.4	43.8	24.6	48.4	41.0	39.3
Long-lasting	10.5	10.2	7.7	18.9	11.6	11.8	15.0	9.1	9.4	16.3

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A2b. Persistence of access to external financing through the usual financing channels shock; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
<b>STRONG OR MODERATE DECREASE</b>										
Transitory	32.0	26.9	49.8	40.9	52.9	20.2	34.9	35.8	32.3	43.7
Only partly persistent	38.4	43.2	15.6	37.1	34.7	58.5	34.1	39.5	32.0	41.8
Long-lasting	29.6	29.9	34.6	22.0	12.4	21.3	31.1	24.6	35.8	14.5
<b>STRONG OR MODERATE INCREASE</b>										
Transitory	64.7	61.0	62.5	82.5	NA	34.1	29.9	76.6	76.2	NA
Only partly persistent	27.0	27.3	37.5	17.5	NA	65.9	70.1	23.5	6.0	NA
Long-lasting	8.4	11.8	0.0	0.0	NA	0.0	0.0	0.0	17.8	NA
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
<b>STRONG OR MODERATE DECREASE</b>										
Transitory	30.1	30.6	25.2	24.3	51.5	24.3	42.2	34.8	25.8	29.1
Only partly persistent	39.1	40.3	32.8	35.0	22.3	53.1	40.3	29.3	37.6	27.4
Long-lasting	30.8	29.1	42.0	40.7	26.3	22.5	17.6	36.0	36.6	43.6
<b>STRONG OR MODERATE INCREASE</b>										
Transitory	52.6	57.8	49.4	44.9	0.0	48.3	13.9	51.6	62.6	29.5
Only partly persistent	36.4	30.5	49.6	41.2	58.1	34.5	32.5	41.6	28.0	29.5
Long-lasting	11.0	11.8	1.0	13.9	41.9	17.2	53.6	6.8	9.4	41.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A2c. Persistence of customers' ability to pay and meet contractual conditions shock; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
<b>STRONG OR MODERATE DECREASE</b>										
Transitory	32.5	29.8	38.7	42.8	30.6	32.4	41.1	31.4	30.9	32.6
Only partly persistent	42.8	43.7	36.1	46.7	51.8	32.4	26.1	48.0	46.8	53.2
Long-lasting	24.7	26.5	25.2	10.5	17.6	35.2	32.8	20.6	22.3	14.2
<b>STRONG OR MODERATE INCREASE</b>										
Transitory	54.9	65.3	28.4	55.8	0.0	77.1	29.9	55.1	51.3	0.0
Only partly persistent	34.7	24.4	56.1	44.2	100.0	22.9	70.1	33.4	35.3	50.0
Long-lasting	10.4	10.3	15.5	0.0	0.0	0.0	0.0	11.5	13.4	50.0
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
<b>STRONG OR MODERATE DECREASE</b>										
Transitory	27.4	27.6	16.9	55.1	17.0	33.4	29.4	28.0	23.7	32.9
Only partly persistent	42.7	40.3	62.9	28.7	48.9	44.5	28.1	52.4	40.2	43.4
Long-lasting	29.9	32.1	20.2	16.2	34.1	22.2	42.6	19.6	36.2	23.7
<b>STRONG OR MODERATE INCREASE</b>										
Transitory	59.3	60.6	60.3	53.9	17.1	47.7	60.0	61.9	62.6	22.8
Only partly persistent	37.1	37.6	33.4	35.1	59.8	44.3	40.0	32.8	37.4	45.6
Long-lasting	3.6	1.8	6.3	11.0	23.1	8.0	0.0	5.3	0.0	31.6

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A2d. Persistence of availability of supplies from the usual suppliers shock; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
<b>STRONG OR MODERATE DECREASE</b>										
Transitory	44.6	43.2	45.7	43.2	74.9	77.9	35.1	48.3	30.5	0.0
Only partly persistent	34.1	33.5	31.5	51.2	14.4	22.1	33.4	29.6	46.0	58.1
Long-lasting	21.4	23.3	22.9	5.6	10.7	0.0	31.5	22.2	23.5	41.9
<b>STRONG OR MODERATE INCREASE</b>										
Transitory	51.5	42.0	65.7	100.0	100.0	25.7	43.9	46.5	71.9	100.0
Only partly persistent	48.5	58.0	34.3	0.0	0.0	74.3	56.1	53.5	28.2	0.0
Long-lasting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
<b>STRONG OR MODERATE DECREASE</b>										
Transitory	36.7	42.3	0.0	14.8	77.7	51.1	39.5	35.1	31.2	0.0
Only partly persistent	41.1	33.2	90.4	70.5	0.0	48.9	46.2	35.4	43.0	100.0
Long-lasting	22.3	24.5	9.6	14.8	22.3	0.0	14.4	29.6	25.7	0.0
<b>STRONG OR MODERATE INCREASE</b>										
Transitory	52.9	53.2	56.1	53.3	0.0	49.1	66.5	49.5	52.0	30.6
Only partly persistent	33.1	33.9	27.8	29.8	72.0	37.5	12.9	37.0	37.6	27.0
Long-lasting	14.0	12.9	16.1	17.0	28.1	13.4	20.6	13.5	10.4	42.4

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.



### A3. Relevance of financing

Table A3a. Credit to finance working capital; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not relevant	55.1	58.2	49.2	44.7	45.9	52.5	49.3	53.9	58.3	70.4
Of little relevance	16.5	14.1	20.1	29.7	9.8	23.3	13.4	16.6	14.1	16.4
Relevant	19.0	18.6	24.8	10.2	24.6	19.8	15.1	19.3	19.5	10.8
Very relevant	9.4	9.2	6.0	15.5	19.7	4.4	22.2	10.2	8.1	2.4
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not relevant	51.4	51.2	53.5	49.2	50.8	55.4	40.2	52.9	51.6	69.2
Of little relevance	21.2	19.1	23.6	37.4	22.4	21.6	23.9	23.4	18.3	16.4
Relevant	18.4	19.0	19.6	8.2	22.4	17.7	23.4	15.1	20.1	12.6
Very relevant	9.0	10.6	3.3	5.2	4.5	5.3	12.5	8.6	10.0	1.9

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A3b. Credit to finance new investment; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not relevant	60.3	62.0	59.6	49.0	54.9	56.5	51.0	65.2	59.5	72.8
Of little relevance	17.4	16.6	15.1	27.9	19.7	21.2	15.7	18.0	15.7	11.7
Relevant	13.2	11.8	19.7	10.5	20.5	14.7	18.4	11.8	12.6	10.8
Very relevant	9.1	9.7	5.7	12.7	4.9	7.6	14.9	5.1	12.1	4.7
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not relevant	60.6	61.4	60.7	52.9	59.0	60.3	46.5	64.2	61.8	74.1
Of little relevance	18.1	16.2	22.6	27.8	22.4	24.1	17.2	17.4	16.8	9.5
Relevant	12.6	12.4	12.3	14.1	18.7	9.8	24.9	11.9	10.4	10.7
Very relevant	8.7	10.0	4.4	5.2	0.0	5.8	11.4	6.5	11.1	5.7

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A3c. Credit to refinance debt; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not relevant	69.6	72.5	66.3	55.3	55.7	74.6	60.6	68.1	70.4	80.8
Of little relevance	12.2	9.6	17.9	23.2	4.9	7.1	9.8	14.4	13.3	8.5
Relevant	9.9	9.3	9.8	13.3	15.6	11.0	7.7	12.6	7.5	6.1
Very relevant	8.4	8.6	6.1	8.2	23.8	7.4	21.9	4.9	8.8	4.7
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not relevant	72.7	74.2	72.5	61.2	59.7	87.8	65.4	70.6	73.0	82.5
Of little relevance	14.7	13.4	15.3	26.2	17.9	15.8	14.6	15.8	13.5	8.8
Relevant	7.7	7.2	9.0	8.9	14.2	1.9	12.8	10.2	6.3	4.9
Very relevant	4.9	5.3	3.3	3.7	8.2	0.5	7.3	3.5	7.3	3.8

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A3d. Credit conditions to finance working capital; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not relevant	53.9	56.7	50.4	38.3	55.7	53.7	58.0	51.5	54.7	70.4
Of little relevance	15.0	13.7	18.8	17.7	14.8	13.8	9.8	17.7	14.4	11.7
Relevant	17.6	15.6	20.0	28.5	19.7	20.6	12.7	17.1	18.0	15.5
Very relevant	13.5	14.0	10.8	15.5	9.8	11.9	19.5	13.7	12.8	2.4
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not relevant	51.5	51.3	53.6	46.2	64.2	50.2	49.7	51.8	51.8	72.2
Of little relevance	20.0	18.5	23.4	27.3	22.4	29.3	23.3	20.4	14.4	15.2
Relevant	17.8	18.3	14.2	21.6	13.4	13.6	14.8	19.9	18.9	12.6
Very relevant	10.8	12.0	8.8	5.0	0.0	6.9	12.2	7.9	14.9	0.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A3e. Credit conditions to finance new investment; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not relevant	58.3	60.6	55.0	45.1	64.8	52.5	63.4	59.9	57.8	73.7
Of little relevance	19.5	18.9	21.0	23.6	9.8	27.5	9.4	19.9	18.2	10.8
Relevant	13.4	11.7	17.1	18.8	15.6	17.4	13.9	12.0	12.6	13.2
Very relevant	8.9	8.9	7.0	12.6	9.8	2.6	13.3	8.2	11.5	2.4
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not relevant	57.4	58.3	56.5	48.4	62.7	53.3	53.1	60.4	57.6	70.0
Of little relevance	20.1	18.6	23.7	27.7	23.1	30.4	16.6	19.9	17.2	11.8
Relevant	13.7	13.5	13.5	15.8	14.2	9.4	23.8	12.5	13.1	16.4
Very relevant	8.8	9.5	6.4	8.2	0.0	6.9	6.6	7.2	12.0	1.9

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A3f. Credit conditions to refinance debt; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not relevant	69.7	72.0	67.3	57.6	60.7	72.0	68.3	64.7	73.0	80.8
Of little relevance	13.5	12.3	16.6	17.3	9.8	13.2	6.3	18.5	11.1	6.1
Relevant	8.8	8.0	7.6	15.6	15.6	7.9	10.4	8.3	9.1	13.2
Very relevant	8.1	7.6	8.5	9.5	13.9	6.9	15.1	8.5	6.8	0.0
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not relevant	71.6	73.3	70.1	59.1	59.7	80.2	67.8	67.0	73.0	80.6
Of little relevance	14.9	13.6	17.4	20.8	22.4	15.2	14.2	17.2	13.0	8.8
Relevant	8.5	8.0	6.9	15.7	14.2	3.6	10.1	10.1	8.7	8.8
Very relevant	5.0	5.0	5.6	4.4	3.7	1.1	7.9	5.6	5.4	1.9

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

## A4. Evolution of components of total costs

Table A4a. Evolution of total costs; percentage of firms

2008-2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	13.8	13.5	13.3	14.6	23.8	15.5	15.7	13.6	12.9	8.5
Moderate decrease	29.7	28.9	29.0	36.5	36.1	29.7	40.1	30.4	27.1	19.7
Unchanged	29.4	32.6	22.5	20.5	14.8	38.5	19.3	31.3	25.7	43.2
Moderate increase	23.2	21.6	27.8	25.8	24.6	12.5	21.4	22.7	28.7	22.5
Strong increase	3.9	3.3	7.4	2.8	0.8	3.9	3.6	2.0	5.7	6.1
2010-2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	4.1	3.7	5.1	5.9	6.0	2.1	5.0	2.8	5.9	3.4
Moderate decrease	16.6	17.7	10.2	18.1	17.2	27.1	10.9	15.7	15.0	5.7
Unchanged	23.6	24.4	20.4	23.0	14.2	22.6	23.3	24.7	22.8	31.8
Moderate increase	45.7	44.0	54.4	43.3	53.0	37.2	49.6	48.1	45.9	45.3
Strong increase	10.1	10.2	9.8	9.7	9.7	11.1	11.2	8.7	10.4	14.5

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A4b. Evolution of labour costs; percentage of firms

2008-2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	11.3	9.7	11.9	19.7	29.5	10.5	13.7	11.8	10.8	7.5
Moderate decrease	25.4	25.8	23.1	24.2	41.0	26.6	31.9	27.0	22.2	21.1
Unchanged	31.7	32.8	31.9	25.4	19.7	38.5	29.3	28.9	31.3	49.8
Moderate increase	29.0	29.7	28.5	27.8	9.8	23.2	16.4	31.2	32.7	21.6
Strong increase	2.6	2.1	4.7	3.0	0.0	1.3	8.7	1.1	3.0	0.0
2010-2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	4.4	4.9	2.0	4.3	4.5	1.0	6.0	3.0	6.8	1.1
Moderate decrease	9.8	11.3	3.5	7.3	9.0	11.4	4.1	11.6	9.2	10.7
Unchanged	18.1	18.1	15.1	25.0	10.5	17.8	17.7	14.9	21.0	25.5
Moderate increase	54.5	53.2	61.4	52.4	61.9	55.1	57.8	58.3	49.9	48.3
Strong increase	13.3	12.5	18.1	11.0	14.2	14.7	14.4	12.2	13.1	14.5

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A4c. Evolution of financing costs; percentage of firms

2008-2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	2.5	2.8	1.3	1.2	9.8	1.1	0.0	4.2	2.3	0.0
Moderate decrease	4.4	3.4	6.2	4.7	24.6	2.9	13.3	4.5	3.0	0.0
Unchanged	70.5	71.9	73.4	61.3	34.4	74.7	76.2	65.7	71.2	84.0
Moderate increase	17.0	16.8	13.1	24.8	26.2	14.3	9.5	18.3	19.1	8.9
Strong increase	5.6	5.2	6.0	8.0	4.9	6.9	1.1	7.3	4.4	7.0
2010-2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	3.7	3.0	4.3	7.8	9.7	3.1	2.1	2.5	5.6	3.0
Moderate decrease	9.8	8.3	10.2	21.7	22.4	8.4	7.4	13.7	7.8	3.8
Unchanged	67.2	69.5	64.6	54.1	39.6	70.7	74.4	63.0	66.8	72.6
Moderate increase	15.8	16.2	13.4	15.4	23.9	14.6	15.5	15.2	17.0	16.7
Strong increase	3.6	3.0	7.6	1.1	4.5	3.2	0.6	5.7	2.9	3.8

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A4d. Evolution of costs of supplies; percentage of firms

2008-2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	3.3	2.9	2.5	6.9	9.8	3.7	6.6	3.1	2.6	0.0
Moderate decrease	15.3	14.6	17.7	12.6	30.3	15.2	23.6	13.3	15.2	6.1
Unchanged	36.6	38.3	32.0	32.4	32.8	27.2	38.2	40.8	36.1	55.4
Moderate increase	40.5	39.4	43.1	46.9	27.1	48.2	29.0	39.3	40.9	36.2
Strong increase	4.4	4.8	4.7	1.2	0.0	5.6	2.5	3.5	5.1	2.4
2010-2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	1.4	1.5	1.0	1.2	4.5	1.0	0.0	1.4	2.1	0.0
Moderate decrease	6.9	6.6	8.1	6.9	10.5	7.1	4.2	9.2	5.7	6.1
Unchanged	28.8	31.0	19.2	26.5	25.4	24.5	36.8	23.4	32.5	35.4
Moderate increase	52.7	51.5	57.9	54.6	54.5	53.6	50.7	58.9	47.4	53.6
Strong increase	10.2	9.5	14.0	10.7	5.2	13.8	8.2	7.0	12.3	4.9

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A4e. Evolution of other costs; percentage of firms

2008-2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	8.4	6.5	9.1	20.6	13.6	0.0	5.6	11.7	9.9	6.9
Moderate decrease	11.9	13.3	12.0	0.5	15.9	0.0	9.3	11.6	17.7	15.3
Unchanged	38.4	43.1	25.3	30.8	15.9	68.6	61.7	36.8	20.4	25.0
Moderate increase	30.8	29.6	32.8	34.6	38.6	24.0	17.8	25.4	42.3	34.7
Strong increase	10.5	7.5	20.9	13.5	15.9	7.4	5.6	14.6	9.7	18.1
2010-2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	2.0	1.3	0.0	10.9	12.0	0.0	6.4	0.6	1.6	6.9
Moderate decrease	8.1	7.8	10.3	8.2	2.0	0.0	1.3	11.7	12.2	4.2
Unchanged	10.0	9.9	7.6	12.2	24.0	5.1	8.1	5.5	16.8	13.9
Moderate increase	51.6	51.9	55.9	40.8	48.0	69.9	57.6	54.2	38.3	56.9
Strong increase	28.3	29.1	26.1	27.9	14.0	25.0	26.6	28.1	31.0	18.1

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

## A5. Evolution of components of labour costs

Table A5a. Evolution of base wages or piece work rates; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	6.2	4.2	9.6	12.7	18.8	5.5	15.1	3.6	6.6	7.3
Moderate decrease	28.4	29.8	23.0	26.7	32.0	31.6	22.8	28.5	28.5	16.3
Unchanged	43.5	44.4	42.6	40.1	34.3	46.7	38.0	48.5	38.6	61.5
Moderate increase	21.2	20.9	23.8	19.4	14.9	16.3	23.0	19.4	24.7	12.5
Strong increase	0.7	0.6	1.1	1.1	0.0	0.0	1.1	0.0	1.5	2.4
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	3.1	3.4	2.0	2.3	4.5	1.0	3.0	2.1	5.1	0.0
Moderate decrease	6.0	6.7	1.2	10.0	4.5	7.2	5.7	4.4	7.1	5.9
Unchanged	26.6	27.2	22.9	32.0	9.0	18.9	28.7	25.3	30.1	34.3
Moderate increase	58.4	57.7	65.7	46.7	77.7	66.7	56.5	64.2	50.4	56.2
Strong increase	5.9	5.1	8.4	9.1	4.5	6.3	6.2	4.1	7.3	3.7

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A5b. Evolution of flexible wage components; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	16.3	14.7	19.2	20.8	28.7	11.6	23.3	19.0	14.5	13.5
Moderate decrease	17.0	16.4	15.2	21.8	31.1	19.8	11.0	17.9	16.4	13.7
Unchanged	51.8	55.5	47.4	34.1	33.6	61.5	52.1	52.8	46.3	58.5
Moderate increase	14.7	13.3	17.2	22.3	6.6	7.1	12.5	10.4	22.3	14.3
Strong increase	0.3	0.0	1.1	1.1	0.0	0.0	1.1	0.0	0.5	0.0
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	5.0	5.6	2.0	5.6	4.5	1.0	1.2	4.4	8.8	2.0
Moderate decrease	5.6	5.5	3.3	10.4	9.6	8.2	9.5	3.5	5.0	4.9
Unchanged	44.9	48.2	39.6	29.3	12.7	29.5	49.0	49.0	46.5	53.4
Moderate increase	38.1	36.6	40.1	42.7	68.7	51.3	34.1	37.4	34.3	36.0
Strong increase	6.4	4.1	14.9	12.0	4.5	10.1	6.2	5.7	5.5	3.7

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A5c. Evolution of number of permanent employees; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	8.4	7.2	9.8	12.6	19.0	14.2	12.4	6.0	7.1	2.4
Moderate decrease	17.6	16.5	19.2	20.1	32.7	12.4	16.4	19.1	18.8	21.1
Unchanged	61.6	64.6	54.4	55.7	42.6	58.4	57.7	65.2	60.8	63.7
Moderate increase	12.3	11.7	16.6	10.1	5.7	15.0	13.4	9.7	13.1	12.8
Strong increase	0.1	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.4	0.0
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	3.1	2.7	3.1	6.6	4.5	2.6	0.6	1.8	5.4	0.0
Moderate decrease	11.6	11.9	7.0	13.5	29.2	9.8	12.5	8.7	14.5	13.7
Unchanged	48.9	50.7	41.4	48.8	38.2	37.8	47.9	54.6	49.2	46.0
Moderate increase	32.8	32.8	37.4	25.2	23.0	41.4	32.3	34.3	27.7	37.4
Strong increase	3.7	1.9	11.1	5.9	5.2	8.4	6.7	0.7	3.2	3.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A5d. Evolution of number of temporary/fixed-term employees; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	3.2	2.5	3.4	8.1	4.9	1.8	3.6	1.7	5.1	0.0
Moderate decrease	3.6	3.2	2.6	6.0	15.4	5.4	11.4	1.6	2.4	8.5
Unchanged	86.8	87.9	88.2	77.2	75.5	92.2	71.3	94.7	81.2	84.8
Moderate increase	6.1	6.4	4.8	7.9	0.0	0.6	12.9	1.7	10.8	6.7
Strong increase	0.3	0.0	1.1	0.9	4.2	0.0	0.8	0.2	0.5	0.0
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	1.8	1.6	2.0	3.7	4.5	1.0	0.6	0.7	3.7	0.0
Moderate decrease	2.6	2.3	3.1	5.2	0.0	1.6	4.2	1.6	3.4	3.9
Unchanged	82.3	83.0	82.9	76.2	69.5	88.6	72.4	84.8	80.7	82.8
Moderate increase	12.1	11.9	11.0	14.0	21.6	8.4	18.0	12.8	11.0	13.3
Strong increase	1.2	1.2	1.0	0.8	4.5	0.4	4.8	0.2	1.3	0.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A5e. Evolution of number of agency workers and others; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	2.0	1.5	2.1	4.3	9.8	1.7	4.1	0.9	2.7	0.0
Moderate decrease	1.2	0.5	3.7	2.4	0.0	0.0	0.0	2.5	0.8	2.4
Unchanged	93.2	94.4	89.7	91.0	89.4	98.4	91.8	94.7	90.0	89.6
Moderate increase	3.6	3.6	4.6	2.4	0.8	0.0	4.1	2.0	6.4	7.9
Strong increase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	0.9	0.4	2.0	2.3	4.5	1.0	0.6	0.0	1.7	0.0
Moderate decrease	1.2	0.8	2.0	4.0	0.0	0.0	3.0	0.0	2.2	2.0
Unchanged	91.8	93.6	87.4	82.3	91.1	91.7	91.7	92.7	90.9	92.6
Moderate increase	5.9	5.2	7.7	10.6	4.5	7.3	4.8	7.1	4.8	5.4
Strong increase	0.2	0.0	1.0	0.8	0.0	0.0	0.0	0.2	0.4	0.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A5f. Evolution of working hours per employee; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	3.6	3.6	2.5	5.2	9.8	7.9	6.6	0.9	3.4	2.4
Moderate decrease	11.1	12.1	8.7	8.4	9.9	15.5	14.3	8.6	10.8	4.6
Unchanged	79.8	78.9	84.2	78.0	79.5	74.7	70.9	85.5	79.1	83.4
Moderate increase	5.5	5.4	4.6	8.5	0.8	1.9	8.2	5.1	6.6	9.6
Strong increase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	2.0	2.4	0.0	1.2	4.5	1.0	2.4	0.7	3.4	0.0
Moderate decrease	5.3	5.9	4.3	3.0	0.0	7.3	0.0	4.1	7.4	5.9
Unchanged	76.8	75.7	80.3	80.4	76.9	72.0	65.4	85.2	75.0	82.4
Moderate increase	14.6	14.6	14.4	15.4	13.4	16.2	32.2	9.3	13.0	6.8
Strong increase	1.3	1.5	1.0	0.0	5.2	3.6	0.0	0.7	1.3	4.9

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A5g. Evolution of other components of labour costs; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	13.3	12.9	7.1	36.4	0.0	3.3	4.1	32.8	9.8	39.5
Moderate decrease	7.4	8.5	0.0	11.8	49.8	0.0	0.0	24.3	4.1	0.0
Unchanged	48.0	50.0	46.9	32.0	50.2	90.0	50.9	24.7	36.4	49.5
Moderate increase	24.7	25.0	27.0	19.8	0.0	6.7	19.4	18.3	42.7	11.1
Strong increase	6.6	3.6	18.9	0.0	0.0	0.0	25.6	0.0	7.0	0.0
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Strong decrease	12.0	13.0	7.5	15.1	0.0	32.2	7.7	34.3	6.5	16.5
Moderate decrease	10.8	11.0	7.5	20.2	0.0	0.0	7.7	6.5	2.2	16.5
Unchanged	27.1	23.1	42.6	28.3	61.4	21.7	23.7	13.4	42.4	42.2
Moderate increase	44.1	47.5	36.1	24.7	38.6	46.1	60.9	45.9	30.6	24.8
Strong increase	5.9	5.5	6.3	11.8	0.0	0.0	0.0	0.0	18.3	0.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

## A6. Measures used to reduce labour input or alter its composition

Table A6a. Collective layoffs; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not at all	65.9	67.2	57.8	74.8	45.6	52.4	74.0	70.7	66.1	81.2
Marginally	22.7	20.5	32.0	16.6	45.6	25.3	20.8	18.8	24.8	18.8
Moderately	4.4	4.1	7.0	3.6	0.0	0.0	5.2	7.5	4.2	0.0
Strongly	7.0	8.2	3.2	5.1	8.9	22.3	0.0	3.0	4.9	0.0
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not at all	74.7	74.6	76.3	78.5	63.0	87.2	55.2	95.1	63.9	75.9
Marginally	22.2	21.6	23.7	21.5	37.0	12.8	35.6	4.9	32.0	24.1
Moderately	3.1	3.7	0.0	0.0	0.0	0.0	9.2	0.0	4.1	0.0
Strongly	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A6b. Individual layoffs; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not at all	19.1	23.0	10.7	10.8	8.8	28.5	13.9	14.8	19.5	0.0
Marginally	46.6	45.7	43.4	56.4	45.7	40.0	65.3	42.8	45.9	80.1
Moderately	20.8	19.2	31.2	13.6	28.0	18.7	15.6	17.3	25.9	14.7
Strongly	13.6	12.1	14.7	19.3	17.6	12.8	5.2	25.1	8.7	5.2
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not at all	25.0	24.5	27.1	33.2	15.7	25.7	17.2	14.6	34.5	17.3
Marginally	51.5	52.8	49.1	33.2	52.9	58.0	44.8	53.6	49.2	76.0
Moderately	19.6	19.9	14.8	19.4	31.4	16.3	32.4	19.5	16.3	6.7
Strongly	3.9	2.8	8.9	14.2	0.0	0.0	5.6	12.3	0.0	0.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A6c. Non-subsidised reduction of working hours; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not at all	44.9	44.8	50.3	37.1	47.0	36.0	44.4	60.1	38.0	68.4
Marginally	24.6	22.2	28.8	30.0	35.3	22.7	21.2	24.9	26.7	13.0
Moderately	17.2	18.5	10.2	19.5	17.7	23.6	9.7	4.5	25.3	18.7
Strongly	13.3	14.5	10.7	13.5	0.0	17.7	24.7	10.5	10.0	0.0
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not at all	45.1	43.8	49.4	49.1	68.6	23.5	56.4	70.8	34.8	78.8
Marginally	33.1	31.6	41.7	50.9	15.7	49.1	19.6	24.4	36.2	21.2
Moderately	15.5	18.3	0.0	0.0	15.7	14.6	18.4	0.0	24.8	0.0
Strongly	6.2	6.4	8.9	0.0	0.0	12.8	5.6	4.9	4.1	0.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A6d. Non-renewal of temporary contracts at expiration; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not at all	74.1	74.7	78.7	66.9	64.2	61.3	71.9	85.8	73.1	61.4
Marginally	13.0	11.5	18.1	12.8	17.9	30.5	24.2	4.5	6.8	19.3
Moderately	4.9	5.0	0.0	8.0	16.5	4.9	1.7	0.0	9.2	5.2
Strongly	8.1	8.8	3.2	12.3	1.4	3.3	2.2	9.7	10.9	14.1
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not at all	77.3	80.1	75.1	33.0	68.2	78.3	78.1	93.8	65.9	88.0
Marginally	17.5	16.1	16.3	56.8	0.0	15.0	22.0	6.2	24.0	12.0
Moderately	3.2	1.9	8.6	0.0	31.9	4.5	0.0	0.0	6.0	0.0
Strongly	2.1	1.9	0.0	10.2	0.0	2.2	0.0	0.0	4.1	0.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.



Table A6e. Early retirement schemes; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not at all	90.9	96.0	85.6	74.2	73.4	90.1	80.0	91.6	94.1	95.3
Marginally	7.5	4.0	10.7	20.1	16.5	4.9	20.0	7.5	4.9	0.0
Moderately	0.9	0.0	3.7	0.0	8.7	3.3	0.0	0.9	0.0	0.0
Strongly	0.7	0.0	0.0	5.7	1.4	1.6	0.0	0.0	1.0	4.7
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not at all	90.0	93.1	83.9	49.1	84.1	78.3	95.2	100.0	87.0	100.0
Marginally	8.7	6.9	7.4	40.7	15.9	15.0	4.8	0.0	12.6	0.0
Moderately	1.3	0.0	8.6	10.2	0.0	6.7	0.0	0.0	0.0	0.0
Strongly	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A6f. Freeze or reduction of new hires; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not at all	21.8	26.5	11.2	12.1	16.3	14.1	12.6	33.5	20.5	8.3
Marginally	12.3	8.7	14.6	23.4	36.9	9.9	17.8	13.7	10.3	34.5
Moderately	17.2	18.9	10.9	20.8	0.0	12.8	27.0	6.1	24.3	9.3
Strongly	48.7	46.0	63.4	43.6	46.8	63.3	42.7	46.7	44.9	47.9
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not at all	25.3	20.8	61.5	23.0	31.6	28.0	22.8	34.1	18.6	62.5
Marginally	30.4	32.4	16.3	23.0	37.0	12.8	35.6	29.2	38.3	18.8
Moderately	13.0	12.5	7.4	27.7	31.4	18.5	20.8	1.3	14.4	6.7
Strongly	31.3	34.4	14.8	26.3	0.0	40.7	20.8	35.4	28.7	12.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A6g. Reduction of agency workers and others; percentage of firms

2008–2009										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not at all	81.4	80.6	83.4	81.3	89.8	74.8	75.3	93.3	78.3	75.5
Marginally	9.5	10.5	6.4	9.9	1.4	12.8	10.9	3.7	11.3	15.2
Moderately	2.5	3.2	0.0	0.0	8.8	1.3	8.6	0.0	2.9	0.0
Strongly	6.7	5.7	10.2	8.9	0.0	11.1	5.2	3.0	7.5	9.3
2010–2013										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not at all	76.0	73.5	92.6	71.9	100.0	59.3	76.8	100.0	69.1	88.0
Marginally	15.1	17.7	0.0	9.0	0.0	25.7	11.6	0.0	20.7	12.0
Moderately	3.1	3.7	0.0	0.0	0.0	0.0	9.2	0.0	4.1	0.0
Strongly	5.8	5.0	7.4	19.2	0.0	15.0	2.4	0.0	6.1	0.0

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

Table A7. Employers' perception about change in strictness of labour laws between 2010 and 2013; percentage of firms

	Economy total					Small					Medium					Large					Very large				
	Much less difficult	Less difficult	Unchanged	More difficult	Much more difficult	Much less difficult	Less difficult	Unchanged	More difficult	Much more difficult	Much less difficult	Less difficult	Unchanged	More difficult	Much more difficult	Much less difficult	Less difficult	Unchanged	More difficult	Much more difficult	Much less difficult	Less difficult	Unchanged	More difficult	Much more difficult
To lay off employees for economic reasons (collectively)	0.2	1.1	85.9	9.7	3.0	0.0	1.5	86.2	9.9	2.4	1.0	0.0	82.3	11.1	5.7	0.0	0.0	91.5	5.9	2.5	4.5	0.0	82.8	4.5	8.2
To lay off employees for economic reasons (individually)	1.1	3.4	80.0	13.0	2.6	1.1	3.7	79.9	13.4	2.0	1.0	2.0	80.0	12.6	4.5	0.0	2.5	82.9	11.0	3.6	4.5	9.0	73.9	4.5	8.2
To dismiss employees for disciplinary reasons	2.7	9.4	80.1	6.1	1.7	3.1	8.4	82.3	4.8	1.4	1.0	13.3	72.3	10.2	3.3	0.8	13.7	73.1	10.0	2.3	4.5	4.5	82.1	9.0	0.0
To hire employees (cost of recruitment, including administrative costs)	0.2	10.2	61.8	24.9	2.9	0.0	10.2	62.7	23.8	3.2	0.0	10.9	59.8	29.1	0.1	2.1	10.0	52.3	31.7	3.9	4.5	0.0	81.3	5.2	9.0
To adjust working hours	0.1	6.1	82.5	9.7	1.6	0.0	6.5	84.5	7.8	1.1	0.0	4.3	75.7	16.7	3.4	0.0	5.8	75.3	15.1	3.7	4.5	4.5	82.8	8.2	0.0
To move employees to positions in other locations	0.4	3.5	85.4	9.1	1.5	0.0	3.3	87.4	7.9	1.4	1.2	4.1	81.1	11.3	2.4	2.3	4.2	73.5	18.9	1.1	4.5	4.5	86.6	4.5	0.0
To move employees across different job positions	0.4	5.8	84.7	7.7	1.4	0.4	5.6	86.9	5.7	1.4	0.0	5.2	79.1	13.6	2.2	0.8	8.5	74.3	16.3	0.0	4.5	9.0	82.8	3.7	0.0
To adjust wages of incumbent employees	0.8	7.5	67.6	19.3	4.8	0.7	8.5	68.1	17.8	4.5	0.0	5.2	69.4	21.3	4.1	2.3	3.2	57.5	31.1	5.9	4.5	4.5	68.7	17.9	4.5
To lower wages at which you hire new employees	0.1	3.3	69.1	21.2	6.3	0.0	2.5	73.4	18.6	5.5	0.0	7.6	58.1	26.5	7.8	0.0	3.2	48.2	39.4	9.2	4.5	4.5	63.4	14.2	13.4
	Manufacturing					Construction					Trade					Business services					By sector: financial intermediation				
	Much less difficult	Less difficult	Unchanged	More difficult	Much more difficult	Much less difficult	Less difficult	Unchanged	More difficult	Much more difficult	Much less difficult	Less difficult	Unchanged	More difficult	Much more difficult	Much less difficult	Less difficult	Unchanged	More difficult	Much more difficult	Much less difficult	Less difficult	Unchanged	More difficult	Much more difficult
To lay off employees for economic reasons (collectively)	0.4	0.0	94.7	2.7	2.2	0.0	0.0	82.9	12.2	4.9	0.0	1.4	84.8	12.3	1.5	0.4	1.7	84.0	9.8	4.1	0.0	3.8	90.1	6.1	0.0
To lay off employees for economic reasons (individually)	0.4	0.9	91.8	5.8	1.1	2.4	7.1	66.8	18.2	5.5	0.7	3.4	80.9	13.6	1.5	1.3	3.4	78.4	13.8	3.3	0.0	1.9	84.4	13.7	0.0
To dismiss employees for disciplinary reasons	0.4	9.0	77.5	10.0	3.1	7.1	3.5	84.3	5.0	0.0	3.7	9.4	79.3	6.2	1.4	1.3	11.9	80.2	4.7	2.0	0.0	3.8	94.3	0.0	1.9
To hire employees (cost of recruitment, including administrative costs)	1.0	1.6	71.6	18.5	7.3	0.0	19.7	41.0	34.6	4.8	0.2	11.9	60.0	26.0	1.8	0.0	9.3	66.0	23.6	1.1	1.9	1.9	66.9	23.6	5.7
To adjust working hours	0.4	2.1	89.0	4.9	3.7	0.0	8.6	82.1	7.3	2.1	0.0	6.0	81.1	12.4	0.6	0.0	7.4	81.0	10.1	1.5	1.9	0.0	85.6	12.6	0.0
To move employees to positions in other locations	1.5	0.4	88.6	6.4	3.1	0.0	9.2	83.0	4.3	3.5	0.2	2.5	86.2	10.5	0.7	0.3	4.1	84.1	10.7	0.9	1.9	0.0	87.5	10.7	0.0
To move employees across different job positions	0.4	1.9	91.3	3.2	3.1	2.4	9.8	78.2	8.2	1.4	0.2	4.1	86.4	8.7	0.7	0.0	7.9	82.4	8.5	1.3	0.0	1.9	88.6	9.5	0.0
To adjust wages of incumbent employees	0.4	1.0	76.6	12.6	9.4	2.4	15.7	58.8	20.5	2.7	0.9	9.5	65.4	21.1	3.2	0.3	5.9	68.6	20.0	5.2	0.0	8.0	64.3	27.8	0.0
To lower wages at which you hire new employees	0.4	0.0	64.6	27.2	7.8	0.0	8.1	63.6	19.4	8.9	0.0	3.2	67.9	24.9	4.1	0.0	3.4	74.1	16.0	6.5	0.0	1.9	68.1	19.4	10.7

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

## A8. Obstacles in hiring workers with permanent, open-ended contracts in 2013

Table A8. Obstacles in hiring workers with permanent, open-ended contracts in 2013: percentage of firms

	Economy total				Small				Medium				Large				Very large			
	Not relevant	Of little relevance	Relevant	Very relevant	Not relevant	Of little relevance	Relevant	Very relevant	Not relevant	Of little relevance	Relevant	Very relevant	Not relevant	Of little relevance	Relevant	Very relevant	Not relevant	Of little relevance	Relevant	Very relevant
Uncertainty about economic conditions	17.9	15.1	43.2	23.9	19.5	12.9	43.3	24.4	11.4	21.7	41.8	25.1	12.8	21.2	48.4	17.6	27.6	29.9	25.4	17.2
Insufficient availability of labour with required skills	12.4	14.5	41.3	31.9	14.3	14.1	41.0	30.7	6.7	17.4	39.7	36.3	4.1	14.8	44.3	36.9	14.9	4.5	55.2	25.4
Access to finance	40.5	30.4	19.0	10.1	39.0	28.9	20.7	11.4	45.3	31.5	16.1	7.0	42.5	40.2	11.6	5.7	36.7	43.3	0.0	0.0
Firing costs	22.7	23.1	33.3	20.8	25.0	21.8	32.8	20.5	14.0	28.8	35.9	21.3	17.5	22.6	35.8	24.1	23.9	36.6	22.4	17.2
Hiring costs	26.9	27.7	32.6	12.7	27.9	25.9	33.1	13.2	24.2	31.0	30.2	14.6	21.2	37.1	36.3	5.4	29.1	44.0	18.7	8.2
High payroll taxes	9.0	6.6	32.8	51.7	9.9	6.1	31.3	52.7	6.4	7.9	38.7	46.9	4.2	7.1	32.9	55.9	10.5	14.9	44.8	29.9
High wages	12.0	17.7	52.3	18.0	13.9	16.8	53.4	15.9	5.7	21.7	48.2	24.4	5.2	19.3	48.2	27.3	14.9	13.4	59.0	12.7
Risks that labour laws are changed	17.3	33.1	35.7	13.9	18.9	31.7	35.2	14.3	14.4	35.5	38.0	12.1	7.3	38.2	40.0	14.5	15.7	58.2	17.2	9.0
Costs of other inputs complementary to labour	26.5	37.5	28.6	7.4	27.8	37.2	27.4	7.6	19.6	38.5	35.2	6.8	24.5	39.5	29.3	6.7	41.8	36.6	17.2	4.5
Other	5.7	2.8	36.2	55.3	6.6	1.5	37.0	54.9	0.0	15.1	24.4	60.5	4.0	0.0	41.2	54.9	0.0	0.0	100.0	0.0
	Manufacturing				Construction				Trade				Business services				Financial intermediation			
	Not relevant	Of little relevance	Relevant	Very relevant	Not relevant	Of little relevance	Relevant	Very relevant	Not relevant	Of little relevance	Relevant	Very relevant	Not relevant	Of little relevance	Relevant	Very relevant	Not relevant	Of little relevance	Relevant	Very relevant
Uncertainty about economic conditions	19.1	15.6	42.3	23.0	11.9	8.2	54.6	25.3	24.7	13.1	42.1	20.1	13.1	18.7	40.7	27.6	25.5	24.7	40.3	9.5
Insufficient availability of labour with required skills	13.1	11.7	33.3	41.9	9.5	13.6	55.6	21.3	17.4	10.6	43.9	28.1	8.1	19.5	37.7	34.7	26.2	15.6	34.2	24.0
Access to finance	40.1	35.2	16.3	8.4	30.4	23.2	28.4	18.0	48.1	23.7	20.2	8.1	36.6	36.9	16.3	10.3	67.7	22.8	7.6	1.9
Firing costs	17.7	27.7	37.2	17.4	11.9	18.2	41.3	28.6	29.6	23.1	29.1	18.2	22.4	22.4	32.9	22.3	23.6	36.5	24.7	15.2
Hiring costs	25.0	25.6	37.9	11.5	27.3	26.2	33.1	13.5	29.1	27.6	32.1	11.1	25.4	29.1	30.8	14.7	36.1	34.6	25.5	3.8
High payroll taxes	13.1	8.8	28.6	49.5	4.8	8.6	32.3	54.3	9.9	5.9	39.1	45.2	7.5	5.4	29.1	58.0	19.8	15.6	28.5	36.1
High wages	12.9	22.4	45.1	19.5	9.5	13.8	61.2	15.5	14.1	20.3	47.2	18.4	10.4	14.6	57.2	17.9	20.5	18.6	43.7	17.1
Risks that labour laws are changed	19.3	26.4	41.7	12.6	12.5	40.6	34.3	12.6	20.1	33.0	32.2	14.7	15.1	33.8	36.8	14.3	32.3	28.1	30.8	8.8
Costs of other inputs complementary to labour	25.4	33.9	31.7	9.0	20.2	39.5	29.9	10.4	30.2	41.7	22.2	5.8	25.5	34.4	33.0	7.1	35.4	47.2	11.8	5.7
Other	13.2	0.0	42.5	44.3	7.4	4.5	43.6	44.5	7.2	5.7	32.8	54.3	0.0	1.9	31.2	66.9	15.2	0.0	24.2	60.6

Notes: firm-weighted averages.  
Sources: Lithuanian WDN3 survey, authors' calculations.

## A9. Minimum wage increase adjustment channels after its increase in January 2013

Table A9. The effect of increase in minimum wages on other macroeconomic variables; percentage of firms

Lay off people										
	Economy	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not relevant	95.7	93.7	99.0	95.2	95.5	92.8	89.3	100.0	92.5	96.1
Of little relevance	3.1	3.5	1.0	3.6	4.5	6.7	3.6	0.0	4.1	3.9
Relevant	1.0	1.3	0.0	1.2	0.0	0.5	0.0	0.0	2.6	0.0
Very relevant	0.6	0.8	0.0	0.0	0.0	0.0	4.8	0.0	0.0	0.0
Don't know	0.6	0.8	0.0	0.0	0.0	0.0	2.4	0.0	0.9	0.0
Hire less										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not relevant	83.0	80.8	89.7	89.5	91.1	82.3	70.0	90.1	81.0	92.4
Of little relevance	7.8	7.7	8.0	8.3	4.5	10.5	13.7	3.6	8.4	3.9
Relevant	4.1	4.9	1.3	2.3	4.5	0.5	6.8	2.8	6.0	1.7
Very relevant	4.6	5.7	1.0	0.0	0.0	6.7	7.1	3.5	3.8	2.0
Don't know	0.6	0.8	0.0	0.0	0.0	0.0	2.4	0.0	0.9	0.0
Increase product prices										
	Economy	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not relevant	74.42	72.2	82.1	79.2	86.6	74.6	56.8	81.2	73.8	92.4
Of little relevance	15.9	16.5	12.4	19.4	4.5	12.1	28.5	13.4	15.7	5.7
Relevant	7.0	7.8	5.5	1.5	4.5	12.9	7.6	4.8	6.2	2.0
Very relevant	1.3	1.7	0.0	0.0	4.5	0.4	2.4	0.0	2.6	0.0
Don't know	1.5	1.9	0.0	0.0	0.0	0.0	4.8	0.7	1.7	0.0
Reduce non-labour costs										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not relevant	66.1	62.8	78.6	70.4	86.6	57.7	56.1	75.6	64.3	78.9
Of little relevance	14.0	14.3	11.6	18.6	4.4	10.2	21.4	11.6	15.7	7.9
Relevant	12.6	14.6	5.4	7.6	8.9	21.2	12.5	9.7	11.6	7.4
Very relevant	5.6	6.0	4.3	3.5	4.5	7.8	5.4	3.2	6.8	5.9
Don't know	1.7	2.3	0.0	0.0	0.0	3.1	4.8	0.0	1.7	0.0
Increase productivity										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not relevant	55.8	52.8	69.6	56.2	67.4	36.7	42.4	64.2	60.8	69.9
Of little relevance	17.6	19.2	7.1	25.1	9.7	17.0	20.8	16.9	17.6	13.6
Relevant	14.9	15.8	13.6	8.7	14.1	26.0	24.2	10.6	10.9	10.6
Very relevant	9.7	9.7	9.7	10.0	8.9	17.3	7.7	7.6	9.0	5.9
Don't know	2.0	2.6	0.0	0.0	0.0	3.1	4.8	0.7	1.7	0.0
Other										
	Economy (total)	Small	Medium	Large	Very large	Manufacturing	Construction	Trade	Business services	Financial intermediation
Not relevant	14.1	11.4	27.4	23.8	0.0	8.3	0.0	20.5	17.8	33.3
Of little relevance	21.3	21.6	14.8	42.1	0.0	32.0	0.0	27.1	16.2	0.0
Relevant	28.1	31.3	15.2	0.0	0.0	47.4	16.8	9.1	36.2	0.0
Very relevant	35.3	35.3	42.7	0.0	0.0	8.3	83.2	43.3	29.9	33.3
Don't know	1.3	0.3	0.0	34.1	0.0	4.1	0.0	0.0	0.0	33.3

Notes: firm-weighted averages.

Sources: Lithuanian WDN3 survey, authors' calculations.

## Appendix B. Employment protection legislation index in Lithuania 2003–2013

This appendix shortly reviews one of the measures commonly used in economic literature to evaluate the flexibility of the labour market. The degree of liberalisation of the labour market is usually assessed by evaluating the stringency of employment protection laws. One of the most widespread methodologies used to quantitatively measure the strictness of employment laws is the so called employment protection legislation (EPL) index developed by OECD.

A very general idea for the EPL index is to quantitatively evaluate employers' cost-bearing burden, associated with hiring and firing processes. Such costs usually would be either directly related to termination of employment contracts or to the regulations imposed by the laws that hinder an employer from desirable hiring process. The latter regulations usually also lead to an additional cost burden.

The EPL index covers, in total, 21 different aspects of employment protection rules<sup>41</sup> that are aggregated into two main sub-indexes: employment protection for regular contracts (EPRC) and employment protection for temporary contracts (EPT). The EPRC sub-index measures the strictness of regulation on terminating the regular labour contracts whereas the EPT sub-index evaluates the legal environment for hiring workers on a temporary basis. The EPRC sub-index on termination of the regular working contracts in addition is split into two parts: the first sub-indicator regards individual dismissals, whereas the second one — assesses additional provisions that apply for the dismissals of groups of workers (in comparison to individual dismissals). The EPRC sub-index is calculated from these two sub-indicators by applying specific weights (5/7 for the regular contracts and 2/7 for collective dismissals) and the synthetic EPRC sub-index can be regarded as a main proxy measuring the level of the liberalisation of the labour market in an economy. EPT sub-index is the other aggregate that allows evaluating the strictness of the regulations on the fixed-term contracts as well as temporary work agency employment. The summarised EPL index (as well as EPRC and EPT sub-indexes) range in the scale from 0 to 6. The lower value refers to the more liberal labour laws as well as less costly or complicated dismissal provisions.<sup>42</sup>

With regard to employment protection indicators for Lithuania, complete time series sets of the EPL index are not available and therefore are constructed in accordance to the OECD 2008 and 2013 methodologies<sup>43</sup> by the Bank of Lithuania. The summary indicators for Lithuania for 2003–2013 and an illustrative example of individual scores for 21 EPL items in 2013 are presented below in Tables B.1 and B.2.

**Table B.1. Summary indexes for Lithuania 2003–2013**

	01/01/2003	01/01/2004	01/01/2005	01/01/2006	01/01/2007	01/01/2008	01/01/2009	01/01/2010	01/01/2011	01/01/2012	01/01/2013
Employment protection for regular contracts (EPRC) index (weights 2013)	3.27	3.27	3.27	3.27	3.27	3.27	2.77	2.70	2.77	2.77	2.77
Of which: regular contracts (EPR) (weights 2013)	3.03	3.03	3.03	3.03	3.03	3.03	3.03	2.93	3.03	3.03	3.03
Of which: collective dismissals (EPC) (weights 2013)	3.88	3.88	3.88	3.88	3.88	3.88	2.13	2.13	2.13	2.13	2.13
Employment protection for temporary contracts (EPT) index (weights 2013)	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	2.88	1.88	1.88
Employment protection legislation (EPL) index aggregate (weights 2008) <sup>(*)</sup>	3.21	3.21	3.21	3.21	3.21	3.21	2.92	2.88	2.81	2.40	2.40

(\*) Standard OECD weights (i.e. non-adjusted to imitate the real situation of the Lithuanian labour market) are applied for calculations (see for instance Venn, 2009 for details)

<sup>41</sup> These aspects include only such events that cause additional costs for employers, i.e. such situations when employees are dismissed either on personal grounds or due to economic reasons, not accounting for the dismissals with fault on the part of an employee.

<sup>42</sup> Time series of EPRC and EPT sub-indexes for OECD countries for 1985–2013 are calculated by OECD and can be found at [www.oecd.org/els/emp/EPL-timeseries.xlsx](http://www.oecd.org/els/emp/EPL-timeseries.xlsx). Weights applied for calculations, as well as individual scores for 21 EPL items, can be found in the same file. See also Venn, 2009, OECD 2013.

<sup>43</sup> The main difference between those two methodologies is the assignment of the different weights to the sub-indexes (see [www.oecd.org/els/emp/EPL-timeseries.xlsx](http://www.oecd.org/els/emp/EPL-timeseries.xlsx) and Venn, 2009 for details). In accordance to the methodology of, for instance, 2008, weights assigned for regular contracts accounted to 5/12, for temporary employment — 5/12, and for collective dismissals — 2/12. Such weight distribution allowed to calculate the aggregated EPL index, which is no longer available in accordance to the methodology of 2013.

**Table B.2. Detailed items used to calculate the EPL sub-indexes, 2013**

	<b>Regular contracts</b>	
1	(REG1) Notification procedures <sup>(1)</sup>	4
2	(REG2) Delay involved before notice can start <sup>(2)</sup>	1
3	(REG3A) Length of notice period at 9 months tenure <sup>(3)</sup>	6
	(REG3B) Length of notice period at 4 years tenure <sup>(4)</sup>	5
	(REG3C) Length of notice period at 20 years tenure <sup>(5)</sup>	2
4	(REG4A) Severance pay at 9 months tenure <sup>(6)</sup>	2
	(REG4B) Severance pay at 4 years tenure <sup>(7)</sup>	4
	(REG4C) Severance pay at 20 years tenure <sup>(8)</sup>	2
5	(REG5) Definition of justified or unfair dismissal <sup>(9)</sup>	4
6	(REG6) Length of trial period <sup>(10)</sup>	4
7	(REG7) Compensation following unfair dismissal <sup>(11)</sup>	1
8	(REG8) Possibility of re-installment following unfair dismissal <sup>(12)</sup>	6
9	(REG9) Maximum time to take claim of unfair dismissal <sup>(13)</sup>	1
	<b>Temporary contracts</b>	3
10	(FTC1) Valid cases for use of fixed-term contracts <sup>(14)</sup>	3
11	(FTC2) Maximum number of successive fixed-term contracts <sup>(15)</sup>	0
12	(FTC3) Maximum cumulated duration of successive fixed-term contracts <sup>(16)</sup>	1
13	(TWA1) Types of work for which temporary work agency (TWA) employment is legal <sup>(17)</sup>	0
14	(TWA2) Restrictions on the number of renewals of TWA assignments <sup>(18)</sup>	2
15	(TWA3) Maximum cumulated duration of TWA assignments <sup>(19)</sup>	0
16	(TWA4) TWA: authorisation or reporting obligations <sup>(20)</sup>	4
17	(TWA5) Equal treatment of regular and agency workers at the user firm <sup>(21)</sup>	6
	<b>Collective dismissals</b>	
18	(CD1) Definition of collective dismissal <sup>(22)</sup>	4.5
19	(CD2) Additional notification requirements in case of collective dismissals <sup>(23)</sup>	3
20	(CD3) Additional delays involved in case of collective dismissals <sup>(24)</sup>	1
21	(CD4) Other special costs to employers in case of collective dismissals <sup>(25)</sup>	0

(1) According to Article 130 of the Labour Code, an employer is obliged to inform the employee in writing about the reasoning behind the dismissal. The employer shall justify termination. No additional notification requirements to the third party (trade unions or labour council — a body functioning similarly to a trade union in accordance to Article 21 of the Labour Code) are required in case of individual dismissals. The exception is made only for employees who are elected to representative bodies of employees (trade union or labour council). In this case, approval of dismissal from the body is needed in accordance to Paragraph 1 of Article 134 of the Labour Code. However, in accordance to Paragraph 4 of Article 134 of the Labour Code, the same guarantees might apply to other employees if such provisions are entitled by collective agreements. Calculation (for EPL indicators): average between assigned EPL scores 1 and 3 —  $(1+3)/2=2$

(2) Typically 1 day when the notice can be directly handed to an employee (for both trade union and non-trade union members). For the employees who are elected to representative bodies of employees (trade union or labour council), the representative body shall take a decision on dismissal within 14 days from the receipt of the notification in accordance to Paragraph 2 of Article 134 of the Labour Code. In case of refusal, the employer is permitted to turn to the court in accordance to Paragraph 3 of Article 134 of the Labour Code. Calculation (for EPL indicators): 1 day for notice in typical cases; 1 day for notice and 14 days for reply for union representative bodies. On average: 8 days  $(1+15)/2$ .

(3) (4) (5) According to Paragraph 1 of Article 130 of the Labour Code, the length of the notice period in the usual cases is 2 months independently on time of tenure. For specific groups of employees listed in Paragraph 4 of Article 129 of the Labour Code, the length of notice period is extended to 4 months. Calculation (for EPL indicators): average between typical cases and specific groups of employees 3 months —  $(2+4)/2$ . In the period of Q3 2009–Q4 2010 shorter notice periods were allowed if such provisions are entitled by collective agreements. Average between typical cases and specific groups of employees for the period of Q3 2009–Q4 2010: 2.25 months —  $(2+1+4+2)/4$ .

(6) (7) (8) According to Article 140 of the Labour Code, the employee is entitled to the compensation of his 1 average monthly wage at 9 months of tenure, 3 average monthly wages at 4 years of tenure and 5 monthly wages at 20 years of tenure.

(9) Justified dismissal is defined in Paragraph 2 of Article 129 of the Labour Code. According to it, an employee can be dismissed due to circumstances related to insufficient qualification, lack of professional skills or misbehaviour at a work place. Restructuring of the workplace, as well as economic and technological grounds, also are legal reasons for dismissal. However, according to Paragraph 1 of Article 129 of the Labour Code, such dismissals are allowed only if the employee cannot be transferred to another position.

(10) According to Paragraph 1 of Article 106 of the Labour Code, a trial period typically shall not be longer than 3 months. Longer trial periods, but not exceeding 6 months, are also allowed in accordance to Paragraph 2 of Article 106 of the Labour Code. Calculation (for EPL indicators): 4.5 months as an average of 3 and 6 months trial periods  $(3+6)/2$ .

(11) Article 300 of the Labour Code determines the amount of compensation following unfair dismissal by decision of the court. In accordance to it, an employee is entitled to his average pay from the day of an unfair dismissal to the court's decision day with, if possible, re-installment in the previous position. It is assumed that the court takes 6 month on average. Calculation (for EPL indicators): 6 months compensation.

(12) Article 300 of the Labour Code states that in case of unfair dismissal, an employee should, in accordance to the court decision, be reinstated in their previous position. Exceptions are made if re-installment is no longer possible due to economic, technological, organisational or similar reasons, as well as due to the fact that the employee would be forced to work under confrontational conditions.

(13) Article 300 of the Labour Code states that in case of unfair dismissal, an employee should turn to the court within 1 month after he/she has been notified about dismissal.

(14) According to Paragraph 1 of Article 109 of the Labour Code, a fixed-term contract is defined as an employment contract concluded for a certain period of time or for the period of the performance of certain work, but not exceeding five years. In accordance to Paragraph 2 of Article 109 of the Labour Code fixed-term employment contracts are prohibited if work is of permanent nature, except for the cases when it is allowed by laws or collective agreements, also when an employee is employed in a newly established workplace. Calculation (for EPL indicators): an average between assigned EPL scores of 1 (i.e. "specific exemptions apply to situations of employer need (e.g. launching a new activity) or employee need (e.g. workers in search of their first job)") for the firms not covered by collective agreements and 2 (i.e. "when exemption exist on both the employer and employee sides") for the firms covered by collective agreements. On average:  $(1+2)/2$ . Before Q3 2010, the Provision 2 of Article 109 of the Labour Code states that fixed-term employment contracts are prohibited if work is of permanent nature, except for the cases when it is allowed by laws or collective agreements. Calculation (for EPL indicators) before Q3 2010: an average between assigned EPL scores of 0 (i.e. "fixed-term contracts are permitted only for "objective" or "material situation", i.e. to perform a task which itself is of fixed duration) for the firms not covered by collective agreements and 2 (i.e. "when exemption exist on both the employer and employee sides") for the firms covered by collective agreements. On average:  $(0+2)/2$ .

(15) No limitations. However, Paragraph 3 of Article 111 of the Labour Code states that if a fixed-term upon the expiry of its term is not extended or is terminated, but within 1 month from the day of its termination another fixed-term employment contract is concluded with the dismissed employee for the same work, then, at the request of the employee, such a contract shall be recognised as a regular employment contract.

(16) According to Paragraph 1 of Article 109 of the Labour Code, a fixed-term contract is defined as an employment contract concluded for a certain period of time or for the period of the performance of certain work, but typically not exceeding 5 years. If an employee is employed in a newly established workplace, the fixed-term contract is valid up to 31/07/2015, afterwards turning into a regular contract. Calculation (for EPL indicators): 60 months.

- (17) No specific limitations. As the law on Temporary Work Agencies (TWA) was enacted in Q4 2011, stricter EPL scores are assigned for the periods prior to Q4 2011.
- (18) No specific requirements. The same rules apply as in the case of regular and fixed-term employment contracts.
- (19) No specific requirements. The same rules apply as in the case of regular and fixed-term employment contracts.
- (20) The TWA has an obligation to report periodically to the State Labour Inspectorate (see [http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc\\_l?p\\_id=413456&p\\_query=&p\\_tr2=2](http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=413456&p_query=&p_tr2=2)); no special administrative authorisation is required.
- (21) According to Article 4 of the Law on TWA, equal treatment regarding pay and working conditions (as compared to those employees that work under regular or fixed-term contracts at the user firm) typically is required.
- (22) Article 130<sup>1</sup> of the Labour Code states that collective dismissals are defined: i) as dismissal of 10 or more employees (for firms with 20–99 employees); ii) as dismissal of no less than 10 per cent of employees (for firms with 100–299 employees); iii) as dismissal of 30 or more employees (for firms with 300 and more employees). Calculation (for EPL indicators): collective dismissal definition applies for 10 and more employees.
- (23) Article 130<sup>1</sup> of the Labour Code states that in case of collective dismissals the Lithuanian Labour Exchange office should be notified in writing prior to dismissals taking place. Consultations with trade unions (or the labour council) are required before the notice of dismissal is handed to the employees. Calculation (for EPL indicators): 1 additional notification requirement on top of those requirements applying to individual dismissals. Before Q3 2008, three additional notification requirements were needed on top of requirements applying to individual dismissals — the employer was obliged to notify the Lithuanian Labour Exchange office, municipal authority and trade unions (or labour council) in writing in accordance to Paragraph 4 of Article 130 of the Labour Code. Calculation (for EPL indicators) before Q3 2008: two and more additional notification requirements on top of those requirements applying to individual dismissals.
- (24) Paragraph 1 of Article 130<sup>1</sup> of the Labour Code states that in case of collective dismissals, the length of the notice period is 30 days. Paragraph 3 of Article 130<sup>1</sup> of the Labour Code obliges the employer to notify the Lithuanian Labour Exchange office after finishing consultations with trade unions (or the labour council). Calculation (for EPL indicators): 1 day for notice to be handed in, 30 days for consultations with trade unions (or the labour council) prior to the notification being handed in. 3 days for registered letter with notification to the Lithuanian Labour Exchange office is not included in calculations, as it takes place within the notice period. On average: 31 days (1+30); 23 days on top of individual dismissals. Before Q3 2008, in case of collective dismissals, notifications to the Lithuanian Labour Exchange office, municipal authority and trade unions (or labour council) had to be handed 60 days prior to dismissal taking place in accordance to Paragraph 5 of Article 130 of the Labour Code. Consultations with trade unions (or the labour council) were also required before decision to dismiss a group of employees was taken. Calculation (for EPL indicators): 1 day for notice to be handed in, 30 days for consultations with trade unions (or the labour council) prior to notification being sent to authorities, notification in writing to be sent to authorities prior 60 days to dismissal. On average: 91 days (1+30+60); 83 days on top of individual dismissals.
- (25) There is no additional severance pay or social compensation requirement on top of requirements applying to individuals dismissals. Calculation (for EPL indicators): 0.